

Open Research Online

The Open University's repository of research publications and other research outputs

The Social Re-Signification of Housing: A Design Guide for Santiago de Chile

Thesis

How to cite:

Arancibia Tagle, Alvaro Antonio (2017). The Social Re-Signification of Housing: A Design Guide for Santiago de Chile. PhD thesis Architectural Association School of Architecture.

For guidance on citations see [FAQs](#).

© 2016 The Author



<https://creativecommons.org/licenses/by-nc-nd/4.0/>

Version: Version of Record

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

oro.open.ac.uk

THE SOCIAL RE-SIGNIFICATION OF HOUSING

A DESIGN GUIDE FOR SANTIAGO DE CHILE

A thesis submitted in fulfilment of the requirements for the degree of
Doctor in Philosophy in Architectural Design by

Alvaro Arancibia Tagle

MPhil Architectural Association, BArch Pontificia Universidad Católica de Chile

Director of Studies: Marina Lathouri

Second Supervisor: Sam Jacoby

The Open University

Architectural Association School of Architecture, London

PhD Programme

30 September 2016

ACKNOWLEDGEMENTS

This work would not have been possible without the support of many people and institutions that have been involved in these years of studies. First of all, thanks to CONICYT and the Becas Chile scholarship programme that funded my MPhil and PhD research. At the AA, I would like to express my deepest gratitude and appreciation to my supervisors Sam Jacoby and Marina Lathouri for their intellectual generosity, commitment, and constant support, which have been crucial to develop the writing and designs of the thesis. At the PhD and Projective Cities programmes, I would like to thank the involved staff and students for their insights throughout these years. My special gratitude as well to the many different people that have collaborated with their critical views: Charles Rice, Felipe Hernández, Adrian Lahoud, Douglas Spencer, Maria Giudici, Christopher Lee, Max von Werz, Isabel Devés, Pablo Moreira, Patricia Ojeda, Paul Rocket, Valerio Massaro, Guillem Pons, Pedro Alonso, Alejandra Celedón, Juan Carlos Chamorro, Alejandro Oroz, Sergio Ramirez, Gonzalo Brenner, Alejandro Awad, and Sara Joiko. Also, thanks to the people who participated in the interviews during my field research in Chile: Juan Carlos Jobet, Daniel Jadue, Eduardo San Martín, Luis Eduardo Bresciani, Pablo Contrucci, Jorge Rodriguez, and Cristián Martinez.

I owe a special recognition to my friends Alberto Coddou, Benjamín Riesco, Francisco Molina, Matías Cuadra, Martin Elton, Pedro Tironi, Felipe Jobet, Daniel La Roche, and Thiago Soveral for their wisdom, inspiration, and sense of humour in all matters. Especially, I would like to thank my parents, siblings, and family for their unconditional support throughout the whole process. Finally, I dedicate this thesis to Ignacia Moreno, whose patient love has been essential to complete this work, and to the memory of Andres Elton.

ABSTRACT

The thesis argues against the neoliberal low-income housing and urban planning policies applied in Santiago de Chile since 1979. Although successful in meeting the historical housing deficit by providing widespread access to homeownership, the lack of including social services, infrastructure, and architectural and urban design have created a model of economic and cultural development highly unsustainable in the long term that ultimately fosters social inequalities. This problem is rooted in the conceptual limitations of the existing policy framework, which does not recognize fundamental social differences – only economic ones – being unable to fully respond to the needs of people living in vulnerable conditions. The thesis calls therefore for a new model of housing and infrastructural provision capable of delivering social welfare by recognizing different forms of 'social' housing and including problems of design to the policy framework of housing. Based on this problem, the thesis investigates the housing design guide as a regulatory instrument that aims at ensuring the overall quality of housing by bringing together policies and design, while providing guidance to different agents involved in its provision. The housing design guide is a powerful means to challenge abstract and technocratic policymaking by posing questions of design at different scales. Thus, the research focus is twofold: it explores the social, political, and regulatory effects of the application of the housing design guide in the context of Santiago, and unfolds a set of fundamental design principles that rethink the disciplinary agencies of this instrument and problems of contemporary design.

CONTENTS

Introduction	8
Part I: Dwelling	22
1.1 The Standard and the Normal	24
1.2 The Minimum Dwelling as a Socio-Political Project	25
1.3 Function versus Change	26
1.4 The Social as an In-Between Scale	45
1.5 Neoliberalism and Sub-Standards	48
1.6 Rethinking Substandard Dwelling Design	52
1.7 Beyond Spatial and Functional Autonomy	62
Part II: Building and Block	64
2.1 The Block and the Urban	66
2.2 Assembling Social and Design Differences	75
2.3 The Urban Block as a Condenser of Architectural and Social Scales	79
2.4 The Autonomous Block and the Problem of Variation	83
2.5 Housing and the Right to the City	92
2.6 Expanding the Housing Policy	93
2.7 The Typological Stigmatization of Housing	94
2.8 Typo-Morphological Agreements	113
2.9 The Block as an Expanded Social and Urban Field	125
Part III: Neighbourhood	126
3.1 Urban Design Tools	128
3.2 Form versus Diagram	130

3.3 Concrete Form – Abstract Form	146
3.4 Housing as a Social Policy	150
3.5 Neoliberal Planning	158
3.6 Public School Education as a Driver of Neighbourhood Planning	163
3.7 From the Urban Plan to Infrastructural Proliferation Systems	173
Part IV: Policy and Planning	174
4.1 Scalar Limitations	176
4.2 Urban Sprawl versus Planning	176
4.3 Technical Reframing	182
4.4 Urban Decentralization	185
4.5 Regulatory Means, Stakeholders, and Processes	189
4.6 Disciplinary Expansion	194
Conclusion	196
Design Component: A Housing Design Guide for Santiago de Chile	200
Contents	202
Part I: Policy and Planning	204
Part II: Neighbourhood	220
Part III: Building and Block	250
Part IV: Dwelling	292
Part V: Inter-Scalar Relationships	314
Bibliography	324

INTRODUCTION

Problem Definition

After spending almost 3 billion pounds on low-cost housing subsidies and seemingly getting close to resolving the problem of the housing shortage in Santiago de Chile, the Chilean government recently discovered that 40% of its low-income housing stock has to be demolished or substantially refurbished at 7 times the original subsidy cost. The recent housing programmes have spectacularly failed at a high social and economic cost (Fig. 1). This is due to a neoliberal housing policy that largely does not recognize the needs of vulnerable social groups and therefore the question of how to reappraise the issue of housing in social terms is to be posed. This means considering a different paradigm; one capable of ensuring social welfare and establishing a clear state responsibility in the provision of housing and its associated physical and social infrastructures. This kind of provision requires the exploration of architectural and urban design issues at different scales, involving new agents, as well as a comprehensive housing procurement system.

To begin with, the problem of housing provision was historically associated with the concept of social housing. It started with the *Working Class Dwellings Act* (Ley de Habitaciones Obreras) of 1906 that responded to demands by low-income groups (Fig. 2). Social welfare was provided for through homes capable of meeting the basic functional needs by families and by equipping residential neighbourhoods with social infrastructures and amenities. These created an environment and lifestyle in which inhabitants were educated as social and productive members of the nation.

But after 67 years of social housing policies, this tradition ended with the military coup on 11th September 1973 by Augusto Pinochet (Fig. 3). All social welfare services were dismantled along with their institutional framework, realizing instead the world's first and most radical experiment of Milton

Friedman's neoliberal economic theories (Fig. 4).¹ Social housing ceased to exist and housing provision became a problem of the private market. The privatisation of housing was successful in reducing the housing deficit, which equalled more than 50% of the existing housing during the 1970's and early 80's. However, the deficit has been understood only as a quantitative problem. This allows technocrats to state that the housing shortage will be completely solved by 2020. The means chosen to address this problem is a system of subsidies that promotes homeownership as the only housing solution. Although subsidies ultimately deliver homeownership, the housing and urban provision itself has been given little consideration by the state. With the housing privately developed in an unregulated land market, most of the subsidy is spent on the acquisition of inexpensive land. Thus, to make subsidies pay for both the land and the house, the state has allowed the lowering of the housing standard to that of a sub-standard minimum dwelling. The houses do not usually exceed 45 square metres and have a fixed and insufficient dwelling programme that fails to answer to more than simple household demands, merely providing inexpensive row housing without any concern for social or urban implications (Fig 5, 6).

Despite the reduction of the housing deficit, the policy of large-scale homeownership neither addresses problems emerging after the initial housing provision – such as the long-term maintenance of dwellings and communal spaces – nor considers the creation

1 The implementation of the neoliberal theories was carried out by a group of 25 young Chilean economists known as Chicago Boys who were trained by Milton Friedman and Arnold Harberger at the Chicago University in the 1960's. The theory was specifically translated to the Chilean context in a book called *El Ladrillo* (The Brick), which was written by scholars at the Pontificia Universidad Católica de Chile and released a few weeks before the military coup in 1973. The book remained secret for 19 years and only became public in 1992, after democracy was restored.



Fig. 1
Low-income housing development in process of demolition (2014). Photo by Municipalidad de Puente Alto.



Fig. 2
Población Huemul (1912): one of the first social housing neighbourhoods built in Santiago. From Imagen ambiental de Santiago 1880-1930.



Fig. 3
La Moneda Presidential Palace after the military coup of 1973. Photo by Luis Poirot.



Fig. 4
Milton Friedman explaining to the press his neoliberal economic theories during his visit to Chile in 1975. Photo by Diario La Tercera.

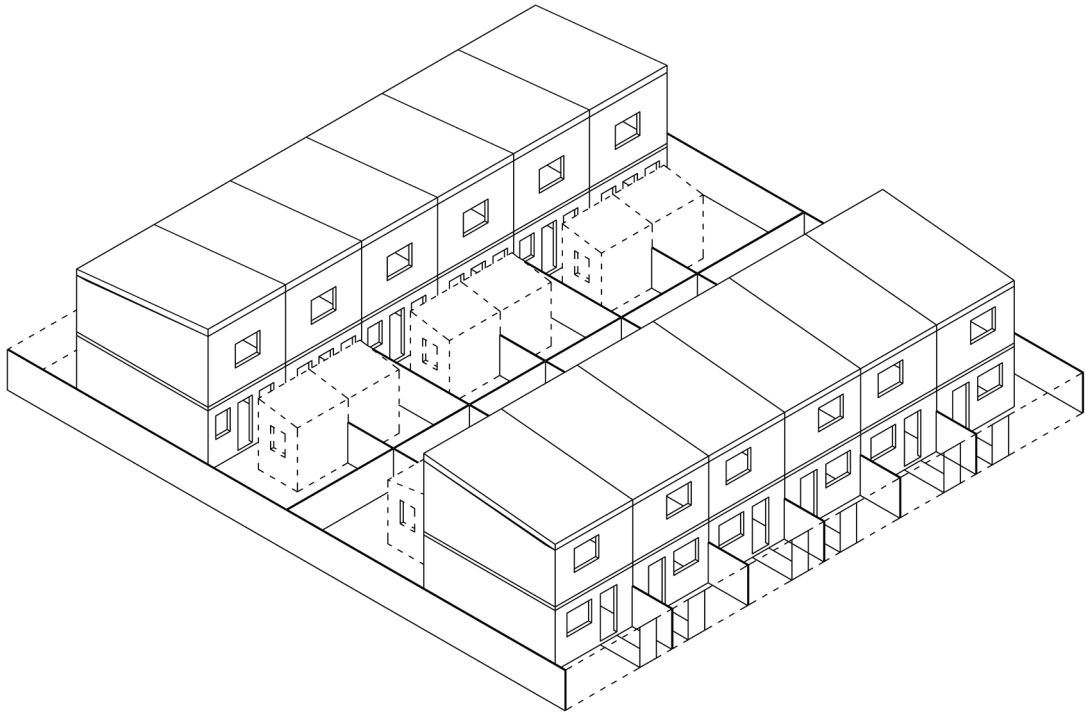


Fig. 5
The row house as the main housing type since the implementation of the neoliberal housing policy.



Fig. 6
The lack of urban design in current low-income housing developments. Photo by Plataforma Arquitectura.



Fig. 7
Poverty in low-income housing. Photo by Maximiliano Robles.

of urban environments in which social and functional coexistence is possible (Fig. 7). The state instead relinquished its responsibility to provide social welfare, transferring that problem to the individual and private housing market. This was a deliberate redefinition of the concept of social housing by removing the differences between forms of housing and only establishing private housing.

The problem of the current housing system is, thus, its inability to respond to and solve social injustice. Moreover, the needs by low-income groups are not limited to housing, but also relate to education, jobs, health, security, and culture among many issues. Thus, low-income housing must also be seen as part of a network delivering social assistance through which vulnerable social groups can overcome their multiple hardships. The housing provision ought therefore to go beyond the mere access to a dwelling and needs to incorporate a number of programmes and facilities required at different urban scales. This

asks for a system of agencies and design regulations that can ensure the proximity between housing and infrastructure, and incorporates principles of architectural and urban design to organize both the system of provision and its relation to the urban environment.

Disregarding this important social welfare and infrastructural aspect of housing, the neoliberal model has had great impact on Chilean cities, particularly in the metropolitan area of Santiago de Chile, where low-income housing became the main cause of urban sprawl and resulted in a highly segregated city. Due to budgetary limitations, only land in inexpensive and peripheral areas of the city could be afforded for the development of low-income housing. These semi-rural housing settlements are deprived of minimum infrastructures and services, and lack any economic activity. They quickly became large and segregated ghettos characterized by poverty and marginalization. Thus, housing ceased to be a driver of social mobility

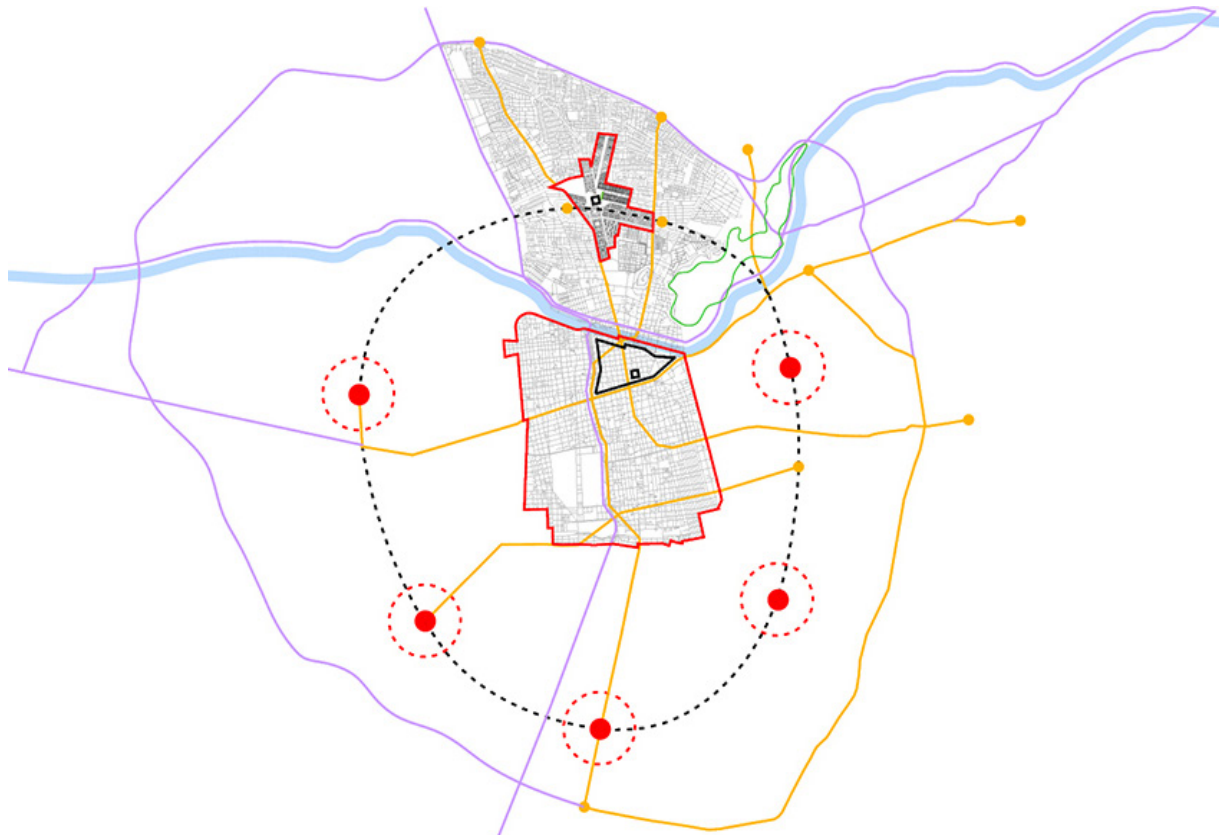


Fig. 8
MPhil project: system of urban centralities and the proposed masterplan.

for all parts of the population. To the contrary, it is described by some as creating 'the poverty of those with a roof'.²

As a consequence, the relationship between low-income housing and the current urban processes is broken. Therefore a new housing and urban model is needed, one enabling low-income groups to live in more urban centres while providing better housing solutions. Responding to this challenge, my MPhil dissertation 'The Social Housing Centre: Type, Urban Form, Policymaking, and Standards in Santiago' (2013) proposed a model that could bring an economic base to low-income housing. It envisioned the creation of new urban and economic centres within well-located but still undeveloped urban areas in Santiago

(Fig. 8). The project also proposed a different administrative and economic strategy, incorporating a number of private and public stakeholders through an incentive-based housing procurement system that operates at two main scales. First, at the scale of the city, it proposed a clearer management of the urban territory. This means reducing the number of administrative areas in the city in order to create 6 large districts. Second, at the scale of the district, each new territorial administration is provided with an urban centre, which is equipped with a number of infrastructures in order to significantly increase economic activities. The spatial proximity between housing and economic infrastructures is intended to create jobs for low-income groups and provide access to schools, health centres, transport infrastructure, green areas, and shopping, among others.

The MPhil dissertation focused on the design for a new centrality in the northern area of Santiago. The proposal consisted of a masterplan to transform

² Alfredo Rodríguez and Ana Sugranyes, *Los con techo: un desafío para la política de vivienda social* [Those with a roof: A challenge for the social housing policy] (Santiago: Ediciones SUR, 2005).

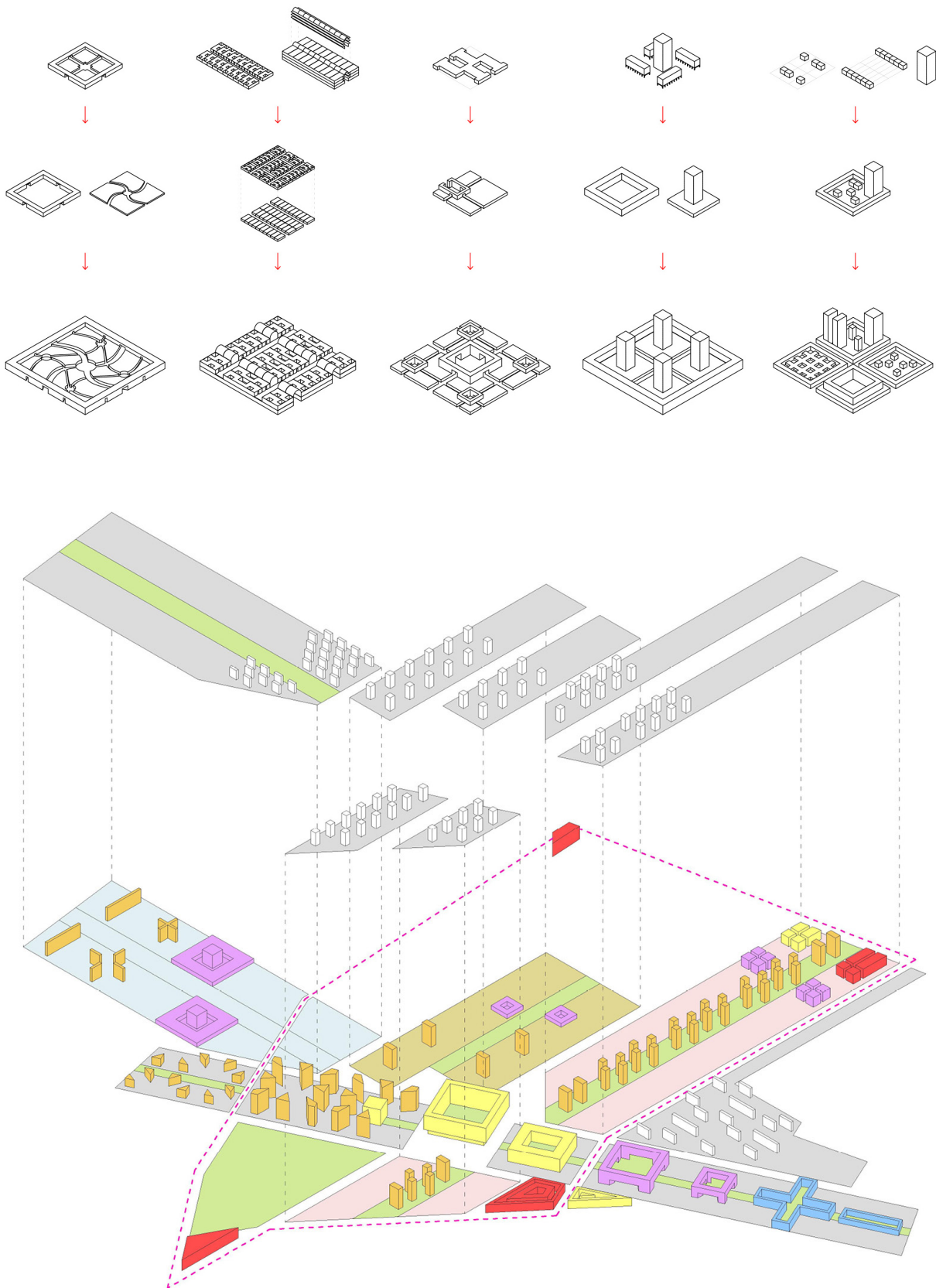


Fig. 9
MPhil project: proposed typological transformations and zoning plan.

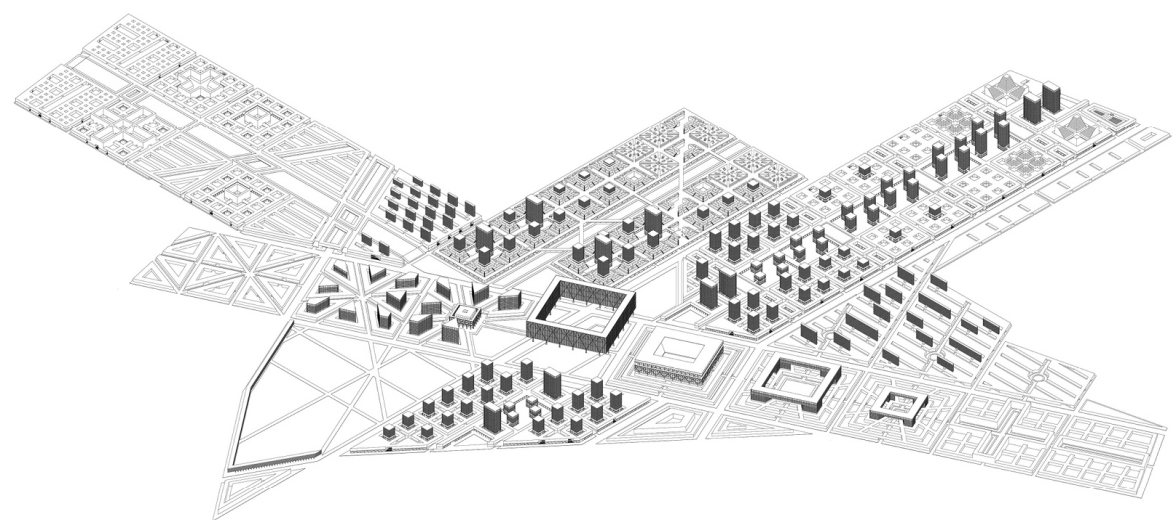
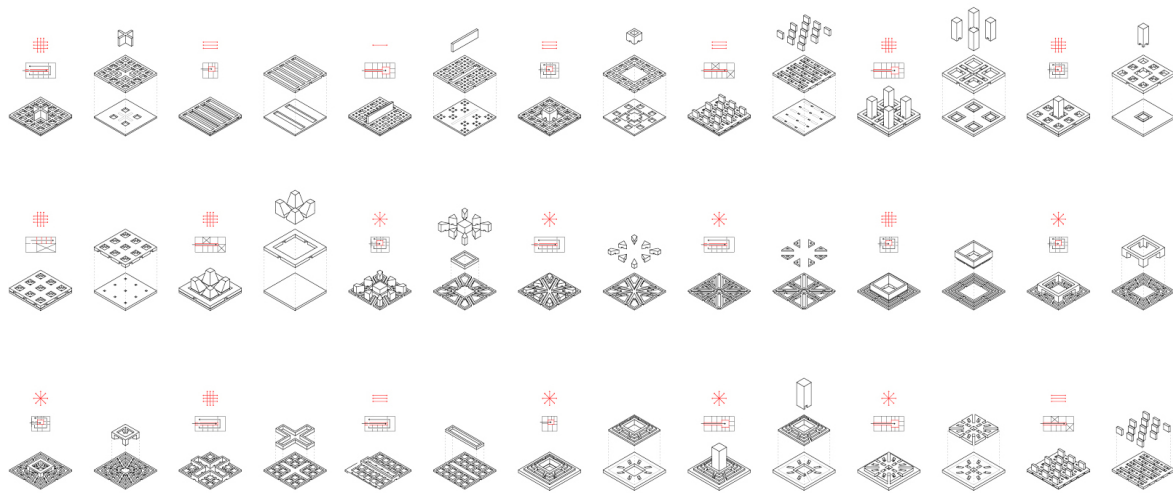
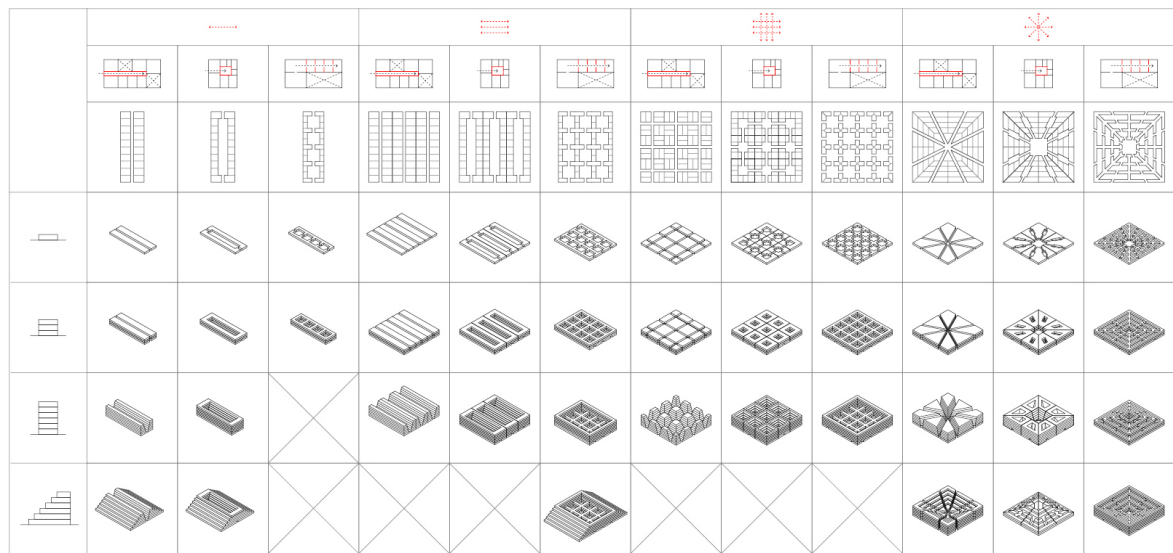


Fig. 10
MPhil project: proposed block solutions and their application in the masterplan.

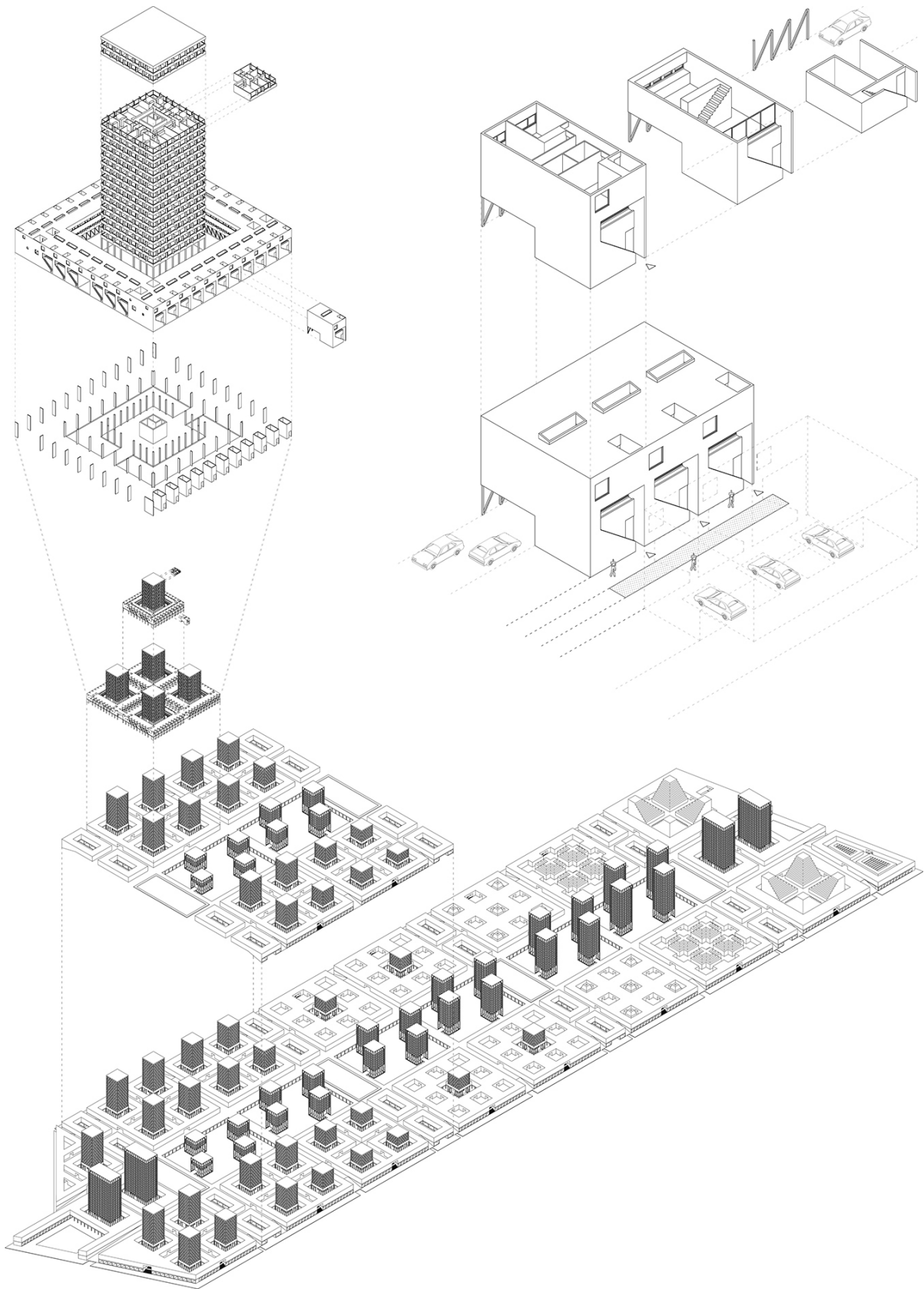


Fig. 11
MPhil project: axonometric drawing of an urban economic fragment and detail of a housing arrangement.

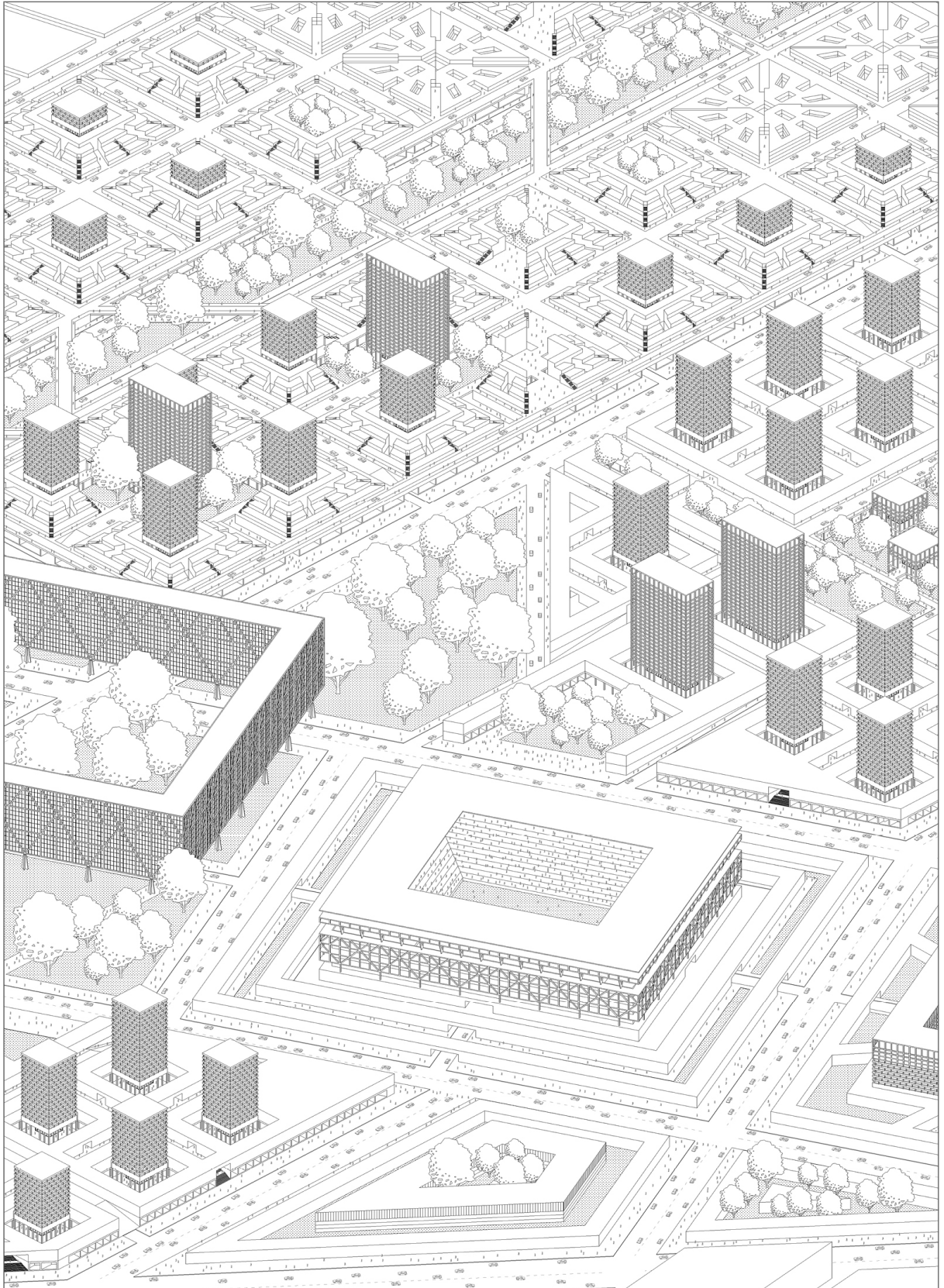


Fig. 12
MPhil project: axonometric drawing of the masterplan's central area.

three poorly developed districts characterized by a dominance of row houses, and led to a critique of the urban outcomes of this building type. Acknowledging its limitations as a mono-programmatic and low-density housing solution, the dissertation explored in detail different housing types implemented throughout the history in Chile. One important aim was to reconsider the lost relationship between building type and urban morphology by revisiting a pedestrian street-based housing solution typical for Santiago's early-twentieth century, called the *Cité*. Although successful in strengthening the pre-existing colonial morphology, the *Cité* was however abandoned, mainly due to its low-density and inability to incorporate cars and new programmes. Responding to this problem, the dissertation proposed a number of typological transformations capable of changing the *Cité* into a high-density and multi-functional building type. The transformations challenged the notion of the masterplan as a traditional plan of horizontal zoning, proposing instead a vertical and more compact system of urban proximities. This created a number of interwoven scales and brought together housing and other programmes with an economic, civic, educational, cultural, and leisure base (Fig. 9, 10, 11, 12).

The problems and outcomes of the Projective Cities MPhil dissertation were critically reviewed and led to the current interest of the PhD research. Acknowledging the difficulty of implementing a number of large-scale masterplans, this PhD thesis develops a less prescriptive approach to design, and explores a regulatory and generic strategy that can include vulnerable social groups in comprehensive urban development processes. The focus is therefore on the investigation of the social, political, and regulatory effects of a housing policy with a broader scope – one capable of accounting for fundamentally different forms of housing – and the need to relate this to problems of architectural and urban design.

Starting from this redefinition of the problem, the thesis develops a discussion at three levels. The first deals with the implications of housing as a social policy, which means that the state has to assume responsibility for the provision of social welfare through its services. This defines housing

not as a problem of more efficient technocracy or a sunk cost to the state, but as an effective long-term political project to create individuals, and ultimately shape society in more egalitarian terms by ensuring opportunities for all. The second level considers the different infrastructures required by housing and its socio-educative implications. This calls for a new regulatory framework capable of bringing together social services. Specifically, public education is here explored as an associated function and complementary policy to housing. In fact, education is already considered by the state as the most powerful strategy to overcome poverty, being the largest social service and the area of greatest public expenditure. The third and final level deals with the need to rethink the role of architectural and urban design in policy instruments in order to introduce strategies for the spatial and functional organization of housing and its associated infrastructures at different scales.

Based on these interrelated discussions, the research objective is to construct a different conceptual framework to understand the housing problem in Santiago de Chile. It is hereby a critique of the current Chilean state, who only improves the deficient system of housing provision through a set of mitigation policies with minor changes to the minimum dwelling and its immediate environment. In addition, the problem of location and urban segregation is overlooked. At present, the state decentralises the city by relocating low-income housing to the periphery, while heavily investing into public transport to connect these areas at a cost that will eventually exceed by far the construction cost of the houses needed to solve the current housing deficit. In order to ensure the affordability of housing, the state is now acquiring plots in the poorest and cheapest areas of the periphery, which demonstrates an imbalance between the system of housing subsidies and private market supply. These failing housing policies seem largely motivated by the desire to prevent the collapse of a barely regulated private property market. But its main outcome is a vicious circle of urban sprawl in the short term, and expensive investments in public infrastructure in the long term.

Within this context, the thesis explores an alternative and more comprehensive approach to the problem of

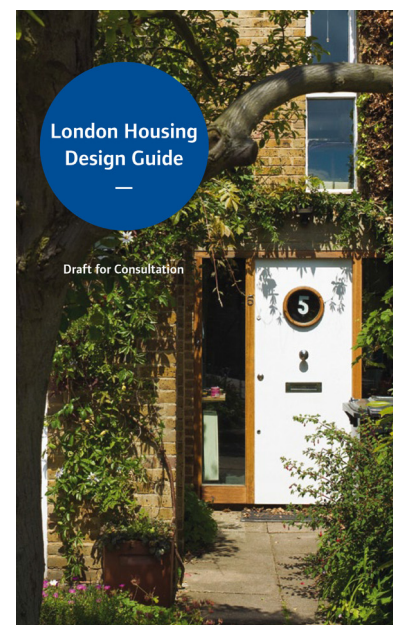
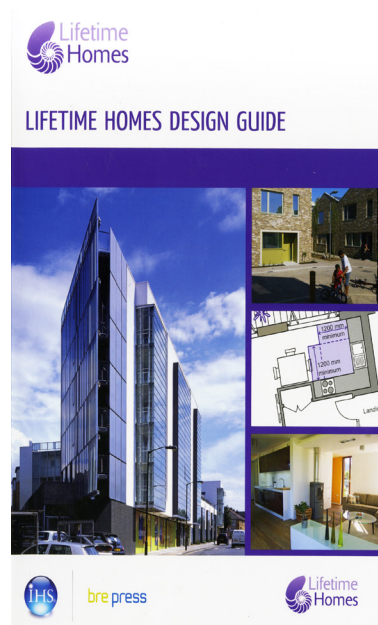
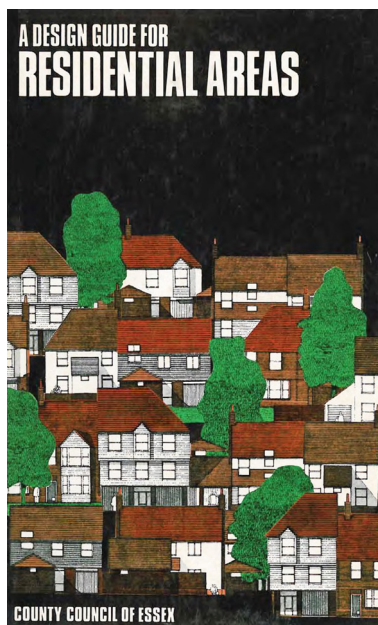
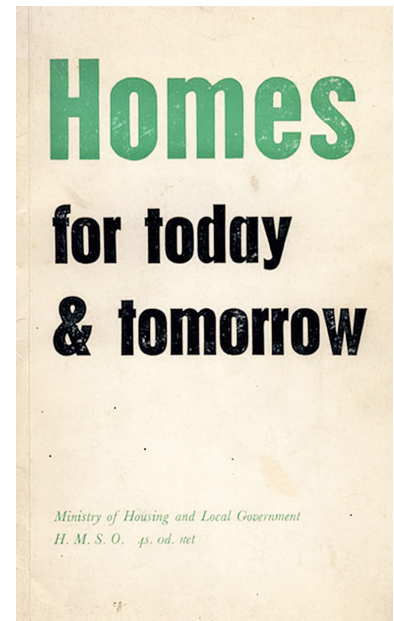
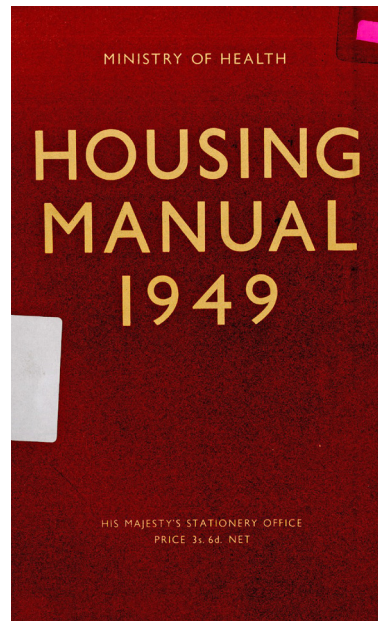
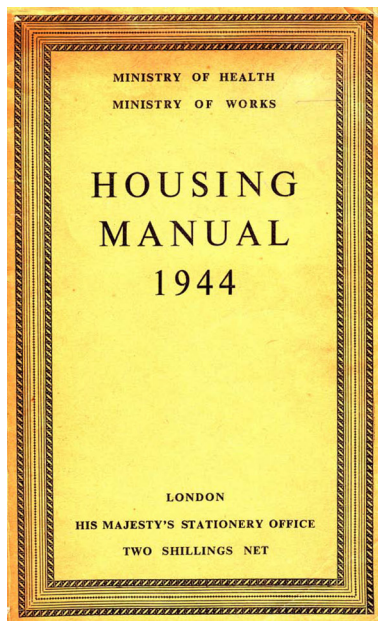


Fig. 13
Different versions of the housing design guide in the UK (1944 - 2010).

low-cost housing. It proposes expanding the network of actors involved in the housing procurement and defines a new regulatory framework that re-introduces the concept of 'social' to housing. As a social service, it must incorporate and coordinate several public administrative bodies responsible for financing and access to housing and its associated infrastructures. The different scales of provision that are required are in this thesis explored through

the agency of the housing design guide: a common regulatory instrument used to ensure a desired standard of provision. It is a hybrid instrument that includes normative functions – in the form of policies and rules – and practical design guidance, providing design criteria and solutions to public and private agents involved in the procurement of housing. The design guide is chosen because of its ability to deal with design in both theoretical and practical terms by

referring, on the one hand, to a disciplinary knowledge of design as well as a conceptual or regulatory problem of housing and, on the other, to concrete practical design solutions to plan and construct real housing. The design guide can do this not only at one scale, but works across different scales, establishing a comprehensive framework for housing and urban design. Thus this thesis will examine how architectural and urban design is an effective means to provide social welfare, mediated by the design guide that is both an abstract regulatory document applicable to general situations and a practice-based design guide for specific cases. This explains the intended relationship between the written thesis and the design guide. The thesis is to raise, develop, and conclude important relationships between existing disciplinary, theoretical, historical, socio-political, economic, and legal disputes that are part of the knowledge and context to which the design guide responds to and provides preliminary conclusions for practice. The design guide is in part a summary of these written arguments and drawn analyses and in parts a further development of the arising design possibilities, privileging the perspective of practice to establish a new ambition of housing quality. Thus both thesis and design guide also address connected but different audiences or stakeholders in the provision of social housing in Santiago.

The agency of the housing design guide, which was clearly recognized in its early historical versions – particularly in the UK – that relied on examples of good practice, current versions are less concerned with ensuring an overall quality (Fig. 13). Their purpose is not anymore to define the main architectural and urban components of housing – whether programmatic, functional or spatial – and their deployment at different scales, but the creation of isolated standards that maintain a ‘freedom of design’ for architects and developers. The problem with this current approach is that each prescribed standard or diagram refers simply to itself. Thus, design guides no longer focus on clarifying qualitative principles of design, but instead have become a neutral compendium of possible design instances. This attitude is also found in Chile, where housing design guides exist in a rudimentary form, and are only understood as a bureaucratic instrument to

ensure minimum floor areas and a basic dwelling programme that are often insufficient. Thus, housing design guides ignore one of the main potentials of architecture: to design precise plans and envision multiple spatial and functional relationships.

The housing design guide should be seen as a powerful means to provide consistency to the policy and institutional framework of housing and urban planning, providing guidance on a range of desirable outcomes of the housing provision, while avoiding to prescribe fixed solutions. By proposing more explicit procedures, it becomes possible to envision a coordinated regulatory framework that can bring back questions of housing quality and a social welfare agenda. The challenge is to rethink and assess the ability of the design guide to deliver a new quality and not just quantity of housing. It can therefore be explored as a means to re-evaluate social welfare elements to housing and imagine a long-term and more ambitious political project.

Based on this, the questions that will drive this research are: What are the social welfare elements that a housing design guide should consider and how can these be framed by questions of design across different scales of intervention? What are the broader political and institutional implications of creating a design guide and how can this strategically affect the provision of housing and its relation to infrastructure in the urban agglomeration of Santiago?

Considering the scale of the housing and urban design deficit and the political commitment that its resolution requires, a comprehensive proposition to that problem needs to affect the city as a whole. That is to say, rethinking the current model of provision means transforming the existing organisation, structure, and architecture of the city. However, to transform the city as a whole, it is necessary to unpack housing problems from the small scale to the large scale and not vice versa. This is a fundamental proposition of the thesis, which understands that in order to propose a new housing model, this cannot be defined on the basis of highly abstract criteria and top-down administrative processes that largely disregard problems of design. On the contrary, it becomes necessary to first account for architectural

and urban design issues to address, inform and bring specific considerations to policymaking, planning, and the creation of standards. In doing so, it is possible to not only propose alternative housing models, but also to rethink how disciplinary design concerns become a matter of public interest.

The role of design in the thesis is to discuss in historical, conceptual (generic), and contextual terms the regulatory and design problems that need to be considered in a contemporary design guide, which is specifically developed for Santiago de Chile, although many of its discussions and conclusions might be transferable to similar contexts. The discussion will be complemented and informed by a number of design propositions that exemplify possible solutions to key problems that the design guide should address at the scale of the dwelling, and then the scales of the building and block, neighbourhood, and the city. Finally, the thesis leads to a design guide, which is both a summary and exploration in more depth of the design and regulatory components that are developed and proposed in the thesis.

DWELLING



The Standard and the Normal

The concept of standard is problematic when referring to issues of housing and in particular to the dwelling design, which is largely determined by fixed dimensions and highly prescriptive dwelling programmes that fail to respond to diverse living patterns and changing household structures. These design parameters have been understood as mechanisms to 'normalize' a housing provision that is in principle deficient. Here another interrelated concept, the 'normal' is understood as the 'average' or 'standard' that does not include the capacity to adapt and respond to fundamentally different demands. In these terms, the design of the standard becomes a means to simplify what should be understood as normal.

Georges Canguilhem in *The Normal and the Pathological* (1978) provides a clarification of the notion of the normal by arguing that the term can be understood in two different ways. On the one hand, it can be defined from a purely quantitative and limited standpoint. This defines the normal as indicating the average demands that are identified through measurable and therefore fixed parameters. On the other, the normal can be understood from a qualitative point of view. This understands it as an unstable state, which means that its demands can vary, requiring versatile responses. In the latter sense, the normal cannot be subject to a rigid and previously determined process. Rather, it has to be able to accommodate changes and thus re-establish the necessary conditions for the development of life.

The distinction between quantitative and qualitative definitions in Canguilhem's argument comes from a critique of the way in which science understood health and disease since the early nineteenth century. Canguilhem blurs the historical line between both states, arguing that the normal is not a rigid and immobile concept but expansive and projective. In fact, the condition of disease is not a state outside of the normal, but a modification of circumstances that ask for a different answer. Based on this, he stresses one

of the main conditions of life; that its course is not determined by a mechanical and ideal sequence of episodes but by exceptions that conform the normal. That is to say, human life is far from a pacific motion of events and in constant fight and negotiation with the limits of norms. Canguilhem provides a clear example of this through the problem of aging, arguing that youth is the healthiest and ideal age. However, this is also a very limited period of life and therefore cannot be seen as normative for other periods such as childhood, adulthood, and old age. As Canguilhem states:

Being healthy means being not only normal in a given situation but also normative in this and other eventual situations. What characterizes health is the possibility of transcending the norm, which defines the momentary normal, the possibility of tolerating infractions of the habitual norm and instituting new norms in new situations [...] health is a margin of tolerance for the inconstancies of the environment.¹

Canguilhem's understanding of the notion of the normal is my entry point to discuss the existing approach to dwelling design, as this has been understood by policymakers and designers through an increasingly abstract and rigid normative framework. This only accounts for a set of quantitative design considerations such as minimum space requirements, furniture schedules, and overall dwelling area, among others, which prescribe fixed and fragile forms of living that are unable to respond to more profound social concerns over time. These concerns go beyond the need to ensure the necessary conditions for biological survival and have to do with problems of living. They include a range of activities concerned with

¹ Georges Canguilhem, *The Normal and the Pathological* (New York: Zone Books, 1989), p. 197.

education, production, reproduction, leisure, and socialization, and ultimately with the need to create an environment for the development of individuals, the family, and society. Hence, the problem of housing and dwelling design cannot be devoid of social content but has to be understood in relation to a larger and more comprehensive framework.

The Minimum Dwelling as a Socio-Political Project

The problem of housing standards is that they lack an ideological drive that would frame the problem of minimum provision as a lifestyle to ensure. Criticising the quantitative and superficial approach to dwelling design, the book *The Minimum Dwelling* (1932) by Karel Teige anticipates this problem by arguing in favour of a deeper understanding of what he calls 'the housing question'.² Teige conceives minimum housing as a socio-political project capable of overcoming individualism and labour exploitation typical for a capitalist system. More specifically, Teige's critique is a counter proposal to the precepts of early architectural modernism discussed during the CIAM II. These mainly relied on problems of standardization and mass-production of the dwelling unit, without consideration for the living standard that they create. To pose this argument differently, instead of producing a catalogue of standardized housing solutions – as *Die Wohnung für das Existenzminimum* did in 1929 – Teige avoids any prescription or design guidance. To Teige, only a political revolution can overcome the housing crisis and *The Minimum Dwelling* was an effort to call for a new socio-political system. As he states:

The question of the dwelling for those earning the subsistence minimum is for practical reasons impossible to solve, simply because the so-called subsistence minimum is identified with a living standard that, in effect, precludes them from a dwelling that, for all intents and purposes, would provide a minimally adequate standard as something af-

fordable rather than as an unattainable luxury. In other words, the housing shortage is an inseparable part of the exploitative capitalist system.³

Thus the housing question, although it cannot avoid quantitative problems deriving from statistics and technology, should have as a main concern how dwellings relate to each other, thereby producing new forms of collectivity and lifestyle. Following this idea, Teige criticizes forms of housing that are exemplified by the bourgeois house. He hereby refers to both the individuality of the ruling class's dwelling programme and the accumulation of functions within the unit (Fig. 1). Although the bourgeois house represents the opposite to collective housing, that does not mean that one should understand the minimum dwelling as a mere space for sleeping. That is, deprived from functions different from the biological needs. He describes this problem in the following way:

We must distinguish between the concepts of dwelling and of lodging in any discussion on housing. Lodging – that is, passing the night and the concurrent regeneration of energy – is a physiological function and thus a matter of biology: dwelling, on the other hand, is a process and an act of social nature. We interpret the term "dwelling" (abode, apartment) as a space, not only serving the biological functions of rest and protection from the rigors of the elements, but also linking these functions with certain economic, productive, and cultural factors.⁴

To Teige, dwelling is essentially an active and social concept that unfolds beyond the individuality of the housing unit. This way, the minimum dwelling is a set of domestic functions organized according to their degree of privacy from the dwelling to the city (Fig. 2). By stating this, he argues against the idea of the minimum dwelling as a space that is only subject to problems of dimensionality and layout's efficiency. This leads to rethinking the overly simplified mini-

2 Karel Teige, *Minimum Dwelling: The Housing Crisis, Housing Reform* (Cambridge, MA: MIT Press, 2002), p. 9.

3 Teige, p. 42.

4 Teige, p. 17.

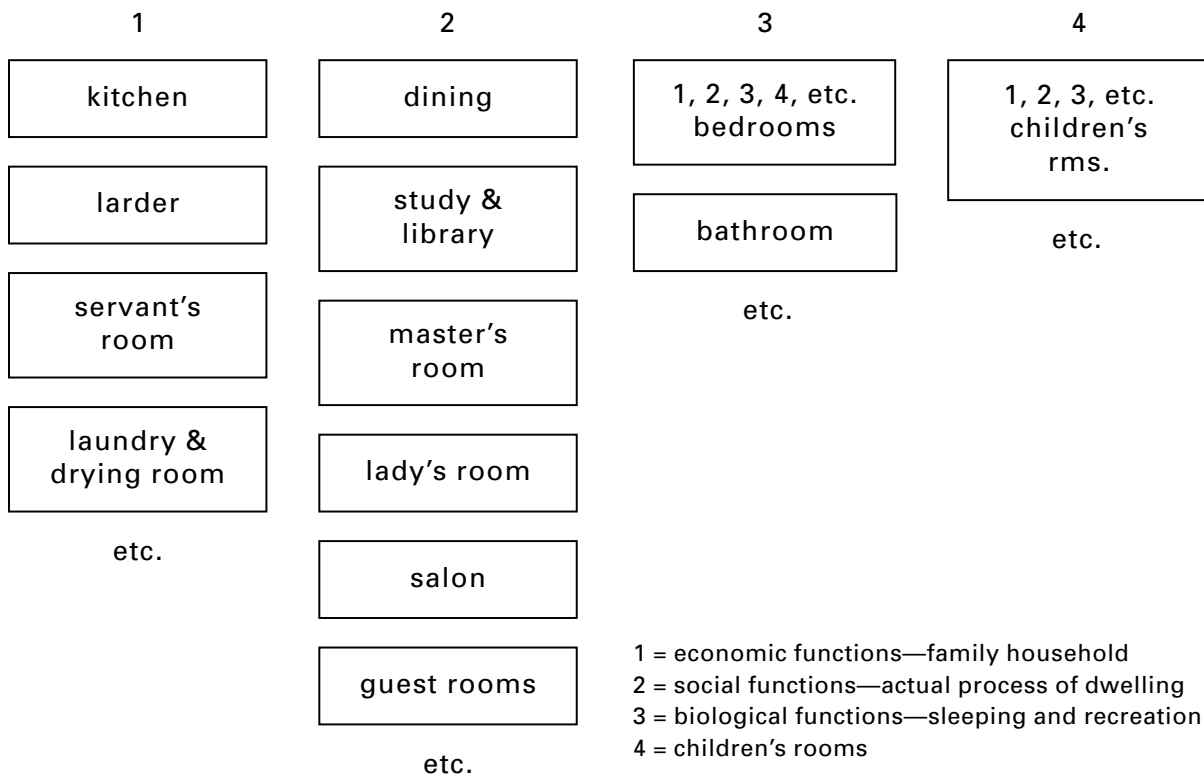


Fig. 1
Diagram of the differentiated bourgeois dwelling programme by Karel Teige. From *The Minimum Dwelling* (2002)

minimum dwelling programme that is no more than an arrangement of conventional functions in small rooms. According to Teige, the minimum dwelling should distance itself from previous housing precedents and be conceptualized as a 'minimal space accommodating "maximal life" for the class of the subsistence minimum'.⁵ To do that, it is necessary to distinguish between two limits. The upper one is defined as 'minimum vivendi' and is the main challenge of housing design. This allows for the possibility of existence in society (quality problem) and should therefore be seen as the threshold for minimum provision. The lower one is the 'modus non moriendi', which aims to satisfy biological needs (quantity problem) and is the limit that most housing provision addresses. Teige, however, instead recognizes both biological and socio-existential needs as part of the same and more profound problem, which, when addressed comprehensively, allows the development of the different aspects of life. In other words, providing an adequate

living standard is an ambitious project that is only possible by addressing the housing problem seen as a whole that includes both quantitative and qualitative considerations.

Following on Teige, it can be argued that despite the need of housing design guides to include technical and quantitative considerations for dwelling design, it does not mean to create a generic regulatory instrument in social and political terms. To the contrary, the quantitative requirements should go hand in hand with the broader concerns of existence itself. That is to say, housing design guides should also be specific from a qualitative perspective, answering therefore fundamental social demands, particularly, those arising from poverty and insufficient education.

Function versus Change

While Teige is very explicit in social and political terms, when referring to problems of design he avoids

⁵ Teige, p. 33.

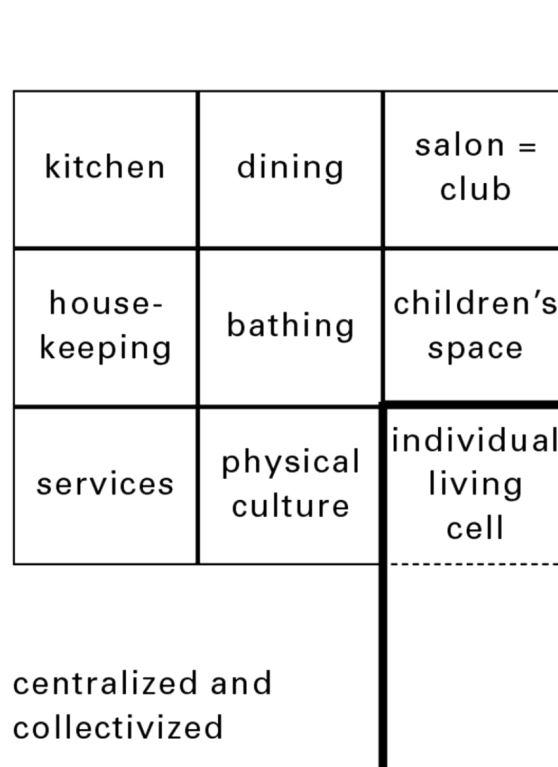


Fig. 2
Diagram of the collective dwelling programme by Karel Teige. From *The Minimum Dwelling* (2002)

explicit proposals. Instead, he discusses a large number of case studies, which do not provide practical ideas or conclusions for the minimum dwelling design. As with Teige, recent guides to housing design avoid providing explicit directions for architectural and urban design. They mainly rely on written recommendations, and so enable a wide variety of designs. However, when the focus is the dwelling unit itself, the information provided by housing design guides is highly prescriptive. Based on the spatial quantification of domestic spaces, they clearly define the needed minimum space standards to accommodate multiple household activities. This way, the prediction of space requirements and answer to functional problems has become the central concern of housing design guides.

Further, what is striking about the current quantification of domestic space is that the dwelling unit is discussed in the same way as in functionalist dwelling studies during early Modernism. More specifically, it is a continuation of the concept of *Existenzminimum* developed in the Second International Congress of Modern Architecture (CIAM II) in Frankfurt in 1929

(Fig. 3, 4). Based on the need to provide mass-produced housing to a growing urban population – mainly an industrial labour force – the congress discussed the problem of the ‘habitation minimum’. The outcomes of the CIAM II were catalogued in a document called *Die Wohnung für das Existenzminimum* that contained 100 different dwelling layouts. The organisation of the dwelling unit was subject to a Fordist rationalization and differentiation of productive activities capable of providing order, efficiency and comfort to the user. More precisely, this was achieved through the standardisation of the kitchen as the centre of domestic production. This functionalist approach to design affected not only the spatial arrangement of the dwelling unit but also the household structure. The housewife was confined to both domestic production (within a small and isolated kitchen) and reproduction of the family (raising of children), becoming a ‘professional’ of the house. The proposed dwelling designs established a clear hierarchy of family roles, preventing woman from performing activities that were not considered in the function-based dwelling plans. This way, by means of a narrowly defined archi-

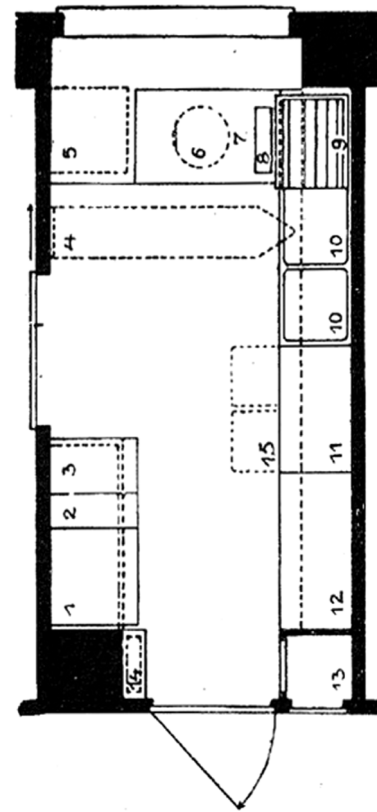


Fig. 3 - 4
The Frankfurt Kitchen by Ernst May (1926-1929). From *Housing in Germany* (2010).

tectural and social design, the housewife had no other lifestyle choice than the one centred on the management of household affairs.

In this context emerged the first housing design guide. It was implemented in the UK at the end of the Second World War as one of the first manifestations of the welfare state. Originally entitled *Housing Manual 1944*, this policy document understood housing as a powerful means to rebuild the country, for which introducing principles of production of the dwelling became a central concern. This meant that a precisely defined dwelling programme should have a direct impact on the social and economic organization of the country. The guide inaugurated an ambitious tradition of housing norms – which continues until today – aimed at addressing social, political, and economic problems through a single and comprehensive design framework. The *Housing Manual 1944*, followed by its subsequent versions of 1949, 1954 and 1955, understood the problem of dwelling design mainly through ideal ‘users’, specifically, through three types of ‘users’. These are defined by the relationship with the kitchen in three different ways, and result in three dif-

ferent dwelling arrangements: ‘Kitchen-Living Room’, ‘Working Kitchen’ and ‘Dining Kitchen’ (Fig. 5). Each dwelling type is defined through a precise programme of rooms, whose areas vary according to the size of the household. Complementary to the kitchen are the bathroom and the scullery – usually consisting of one or more rooms in the house that concentrate dirty household work and the fuel-heating system – providing hygiene and technological infrastructure to the house (Fig. 6, 7). Through the prescription of these programmes, most of the guidance is therefore focused on the scientific control of the house.

Even though each dwelling programme aspires to specificity, to Adrian Forty, the idea of ‘user’ eliminates the subject as ‘occupant’ or ‘inhabitant’, denying individual requirements and subjectivity.⁶ Instead, the concept of ‘user’ becomes a means to prescribe functions to dwellers. In fact, the word ‘user’ is no more than a vague concept that deprives members

6 Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames & Hudson, 2000), p. 312.

of modern societies of their living experience. Thus, like previous functionalist studies, the 'user' proposed by the *Housing Manual* is a means to define a minimum dwelling programme while avoiding considering problems of existence. Seen through Teige's ideas, the dwelling programme is defined according to the level of 'minimum moriendi', the factual means to survive, which is in fact a biological problem.

The restrictions of the early housing design guides became problematic in the late 1950's. This is due to the recognition of the limitations of the user-defined dwelling and asking for less prescriptive design standards instead; ones capable of accommodating the demands and activities according to 'user needs'. Thus, the housing design guide as such was superseded by a government report called *Homes for Today & Tomorrow* (UK, 1961), also known as the Parker Morris standards. This document avoided explicit architectural prescriptions, focusing instead on purely quantitative aspects – such as floor areas and lists of desirable domestic and technical conditions – and conceptual diagrams. Instead of defining standards for each room according to functions, the report recommended a larger and overall size for the entire dwelling (Fig. 8, 9). This avoided prescribing conventional or predefined dwelling arrangements, and was seen as achieving both design flexibility and adaptability that meet individual requirements.

For Parker Morris, by providing larger dwellings and better heating it was possible to deploy a set of new activities. Time-consuming and labour intensive routines could be replaced by new technological appliances, which required more space to be accommodated within the domestic space. Through these, however, dwellers would gain more time to spend on leisure activities. That meant introducing a new idea of efficiency, and replacing the kitchen as the centre of domestic production. This transformed the role of the woman at home, and focused more on the general household management than on domestic production. That is to say, the accumulation of mass-produced objects was seen as a means for social and spatial emancipation from the kitchen. To achieve this, the house was understood as a free space that is not anymore determined by walls but by technology and transparency. This was expressed in the report

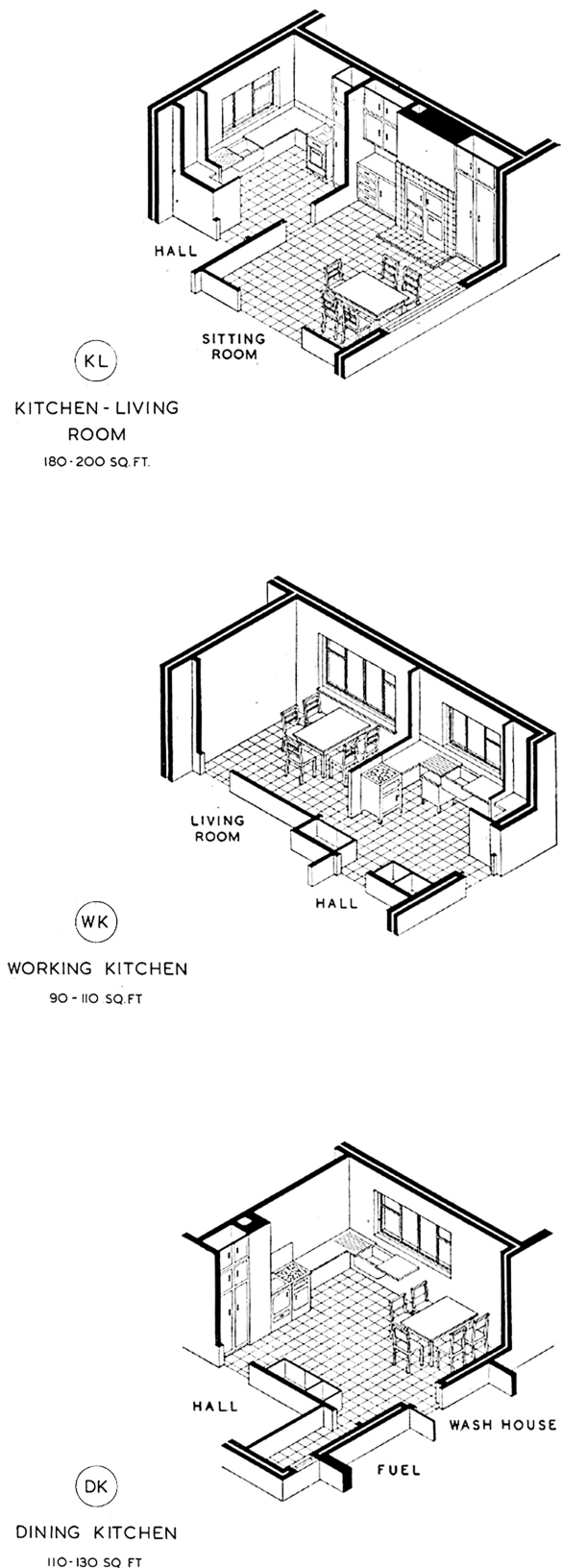


Fig. 5
Different forms of life and users according to 3 kitchen arrangements. From *Housing Manual* 1949.

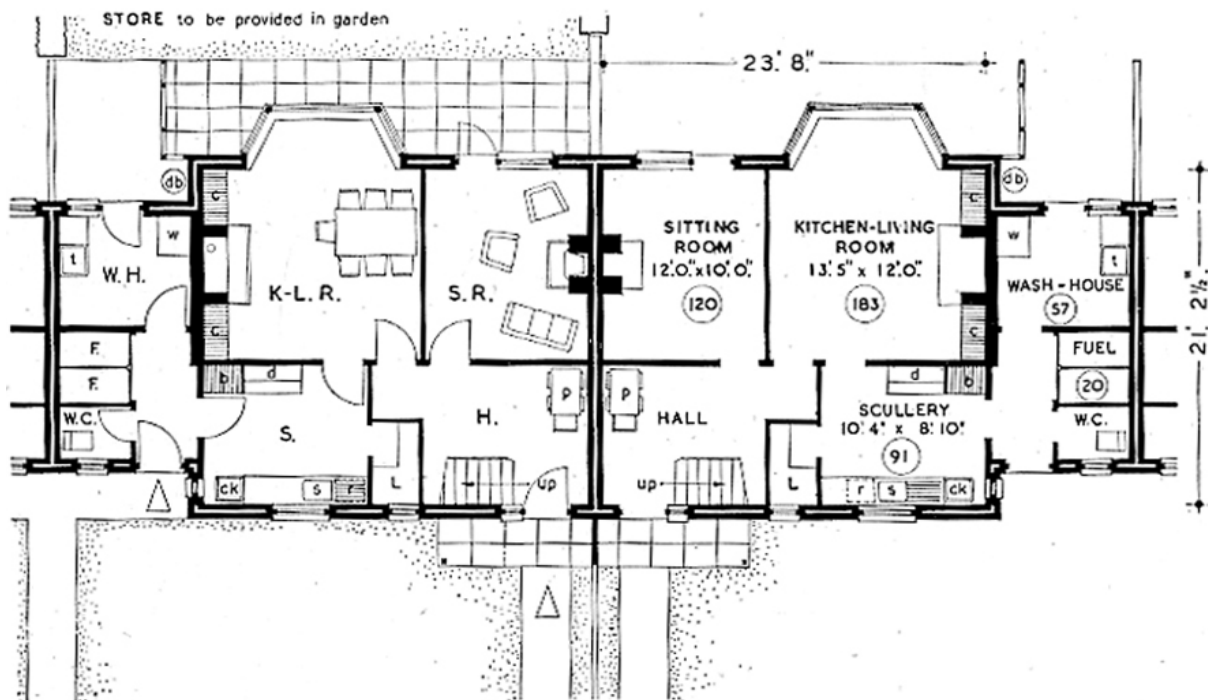


Fig. 6
Ground floor of a house that considers the scullery as part of the dwelling programme. From Housing Manual 1949 (1949).

through a series of conceptual diagrams that dissolve the dwelling's physical boundaries and stress the idea of spatial fluidity, multiplicity of domestic activities, and the proliferation of technological appliances (Fig. 10, 11).

Providing flexibility was the fundamental aim of the creation of dwelling standards. They had to respond to the many demands of modern life, which were determined by constantly changing and difficult to anticipate future needs. This way, space redundancy became a strategy to absorb new living patterns and answer varying demands. However, although it seems that Parker Morris placed the dweller's needs at the centre of housing design – apparently overcoming the modernist idea of the 'user' – the great emphasis on achieving freedom through mass-produced objects established a new form of functionalism. The micro-scale of the dwelling was understood as a device for mass-consumption of goods that had the ability to impact on a general economy driven by the principles of mechanisation and mass production. According to Gary A. Boyd, *Homes for Today and Tomorrow* 'represent a continuation and completion of

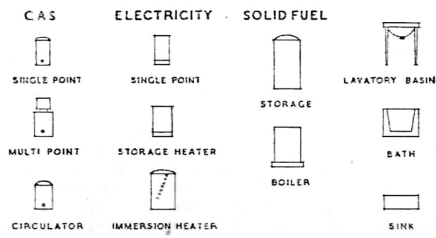
the Fordist house project. Their diagrams are icons of a dream of a planned economy where domestic technologies and living space would be deployed by the State as a means of achieving balance between production and consumption at the level of the nation'.⁷ Even more, the dwelling became a space designed to absorb commodities, ultimately becoming a commodity itself, at a larger scale.

Despite the fact that the standards proposed in this report were abolished in 1980, they are still used in housing design guides such as *The Essex Design Guide* (2005). Here the standards are applied to a range of dwelling layouts, with the intention of providing more examples of dwelling design. However, this is only seen as a means to organize the overall dwelling program in relation to the aesthetical values of the traditional English townhouse (Fig. 12). By mainly focusing on dwelling sizes, *The Essex Design Guide*

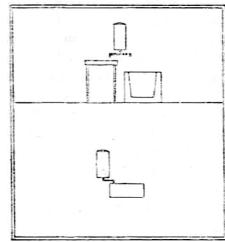
7 Gary A. Boyd, 'Parker Morris and the Economies of the Fordist House', in *Economy and Architecture*, ed. by Stephen Kite, Mhairi McVicar, Juliet Odgers (London: Routledge, 2015), pp. 38-48 (p. 45).

HOT WATER INSTALLATIONS

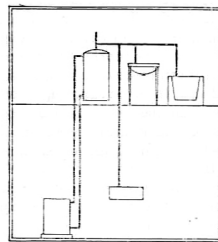
KEY TO APPLIANCES



A. INSTALLATIONS USING ONE FUEL



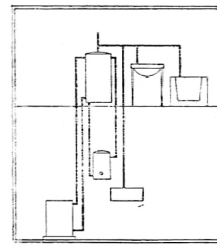
RAPID SINGLE-POINT GAS OR ELECTRIC WATER HEATER



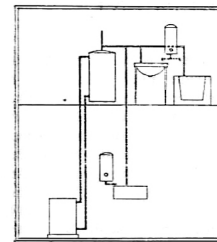
SOLID FUEL

B. INSTALLATIONS USING TWO FUELS

GAS AND SOLID FUEL

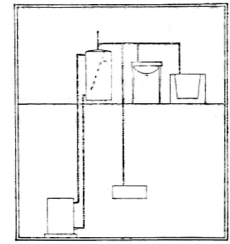


GAS CIRCULATOR

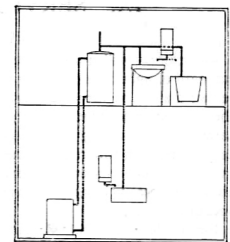


RAPID SINGLE POINT GAS WATER HEATER AS AUXILIARY TO SOLID FUEL

ELECTRICITY AND SOLID FUEL



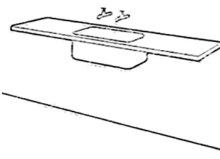
ELECTRIC IMMERSION HEATER



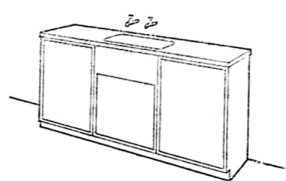
SINGLE POINT ELECTRIC STORAGE WATER HEATER AS AUXILIARY TO SOLID FUEL

SINK UNITS

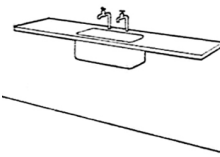
A. WASHING DISHES AND PREPARING FOOD ONLY



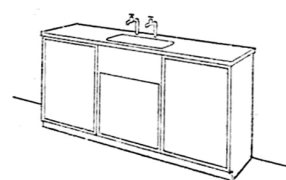
METAL UNIT 5' 3" LONG × 1' 6" WIDE



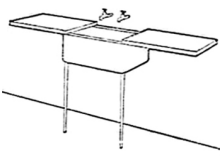
METAL UNIT 5' 3" LONG × 1' 6" WIDE WITH CUPBOARDS



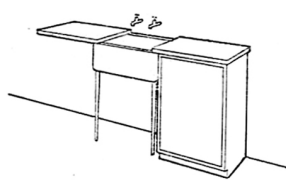
METAL UNIT 5' 3" LONG × 1' 9" WIDE



METAL UNIT 5' 3" LONG × 1' 9" WIDE WITH CUPBOARDS

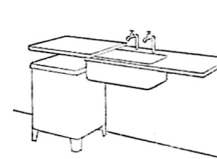


UNIT WITH FIRECLAY SINK 2' 0" LONG × 1' 6" WIDE

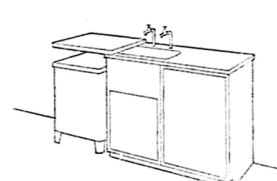


UNIT WITH FIRECLAY SINK 2' 0" LONG × 1' 6" WIDE AND ONE CUPBOARD

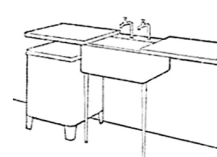
B. WASHING DISHES, PREPARING FOOD AND WASHING CLOTHES



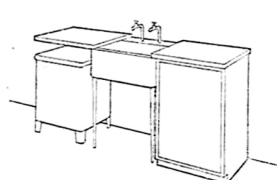
UNIT WITH METAL SINK AND DRAINING BOARD 3' 6" LONG × 1' 9" WIDE AND LOOSE DRAINING BOARD COVERING WASH-BOILER



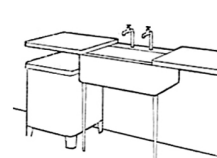
UNIT WITH METAL SINK AND DRAINING BOARD 3' 6" LONG × 1' 9" WIDE WITH CUPBOARDS AND LOOSE DRAINING BOARD COVERING WASH-BOILER



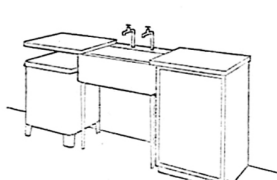
UNIT WITH FIRECLAY SINK 2' 0" LONG × 1' 9" WIDE. THE LEFT-HAND DRAINING BOARD IS LOOSE AND COVERS WASH-BOILER



UNIT WITH FIRECLAY SINK 2' 0" LONG × 1' 9" WIDE AND ONE CUPBOARD. THE LEFT-HAND DRAINING BOARD IS LOOSE AND COVERS WASH-BOILER



UNIT WITH FIRECLAY SINK 2' 6" LONG × 1' 9" WIDE. THE LEFT-HAND DRAINING BOARD IS LOOSE AND COVERS WASH-BOILER



UNIT WITH FIRECLAY SINK 2' 6" LONG × 1' 9" WIDE AND ONE CUPBOARD. THE LEFT-HAND DRAINING BOARD IS LOOSE AND COVERS WASH-BOILER

Fig. 7

Examples of technical guidance: hot water installations and sink units. From Housing Manual 1944 (1944).

net floor area	6 people	5 people	4 people	3 people	2 people	1 person
3-storey house *	1050	1010	—	—	—	—
2-storey centre terrace	990	910	800	—	—	—
2-storey semi or end		880	770	—	—	—
Maisonette				—	—	—
Flat	930	850	750†	610	480	320
Single storey house	900	810	720			

Fig. 8
Dwelling areas proposed by Parker Morris. From *Homes for Today & Tomorrow* (1961).

general storage	square feet					
Houses ‡	50	50	50	45	40	30
Flats and Maisonettes						
Inside the dwelling	15	15	15	12	10	8
Outside the dwelling	20	20	20	20	20	20

Fig. 9
Storage areas proposed by Parker Morris. From *Homes for Today & Tomorrow* (1961).

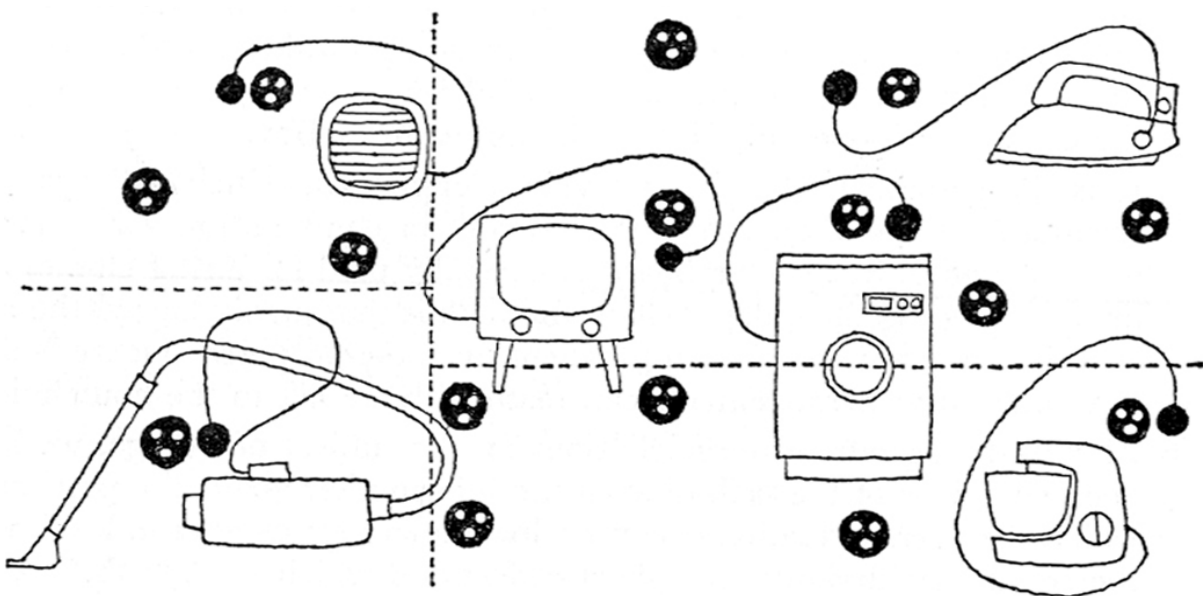


Fig. 10
Diagram that centres on the deployment of technological appliances as drivers of new patterns of living. From *Homes for Today & Tomorrow* (1961).

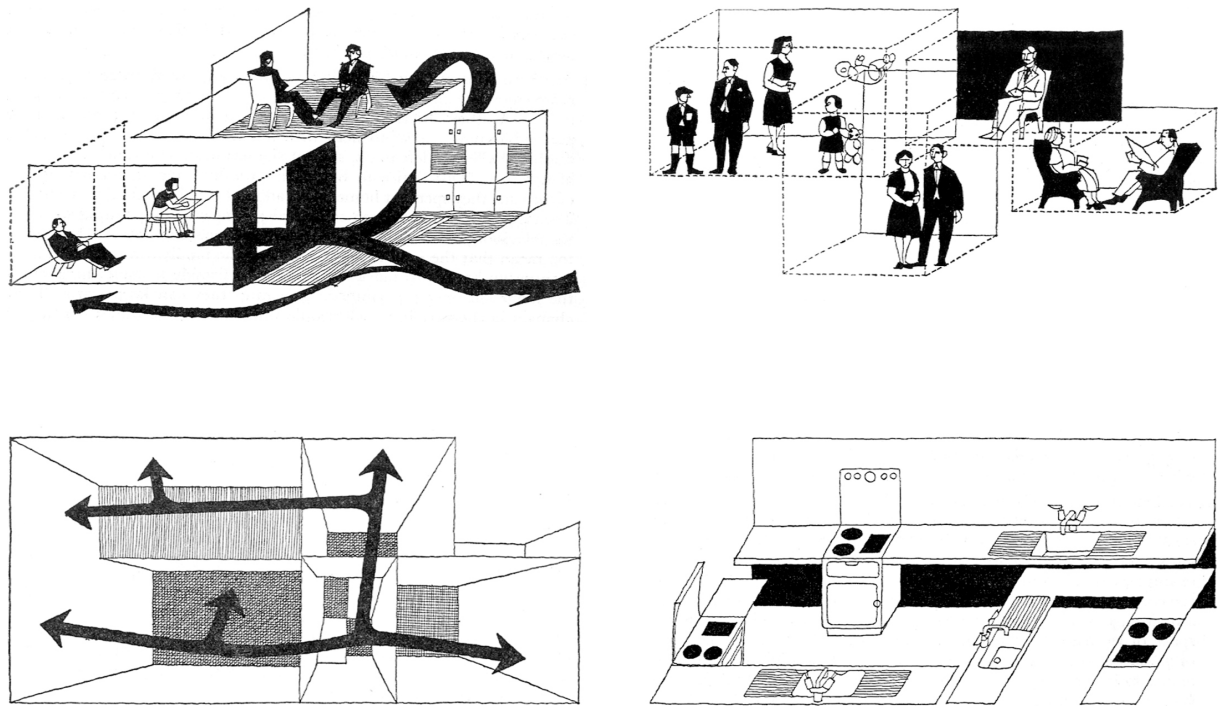


Fig. 11
Diagrams that express the ideas of space fluidity, space indeterminacy, and flexibility. From *Homes for Today & Tomorrow* (1961).



Fig. 12
Guidance based on visual criteria: dwelling layouts and their facades that recreate the traditional English townhouse. From the *Essex Design Guide* (2005).

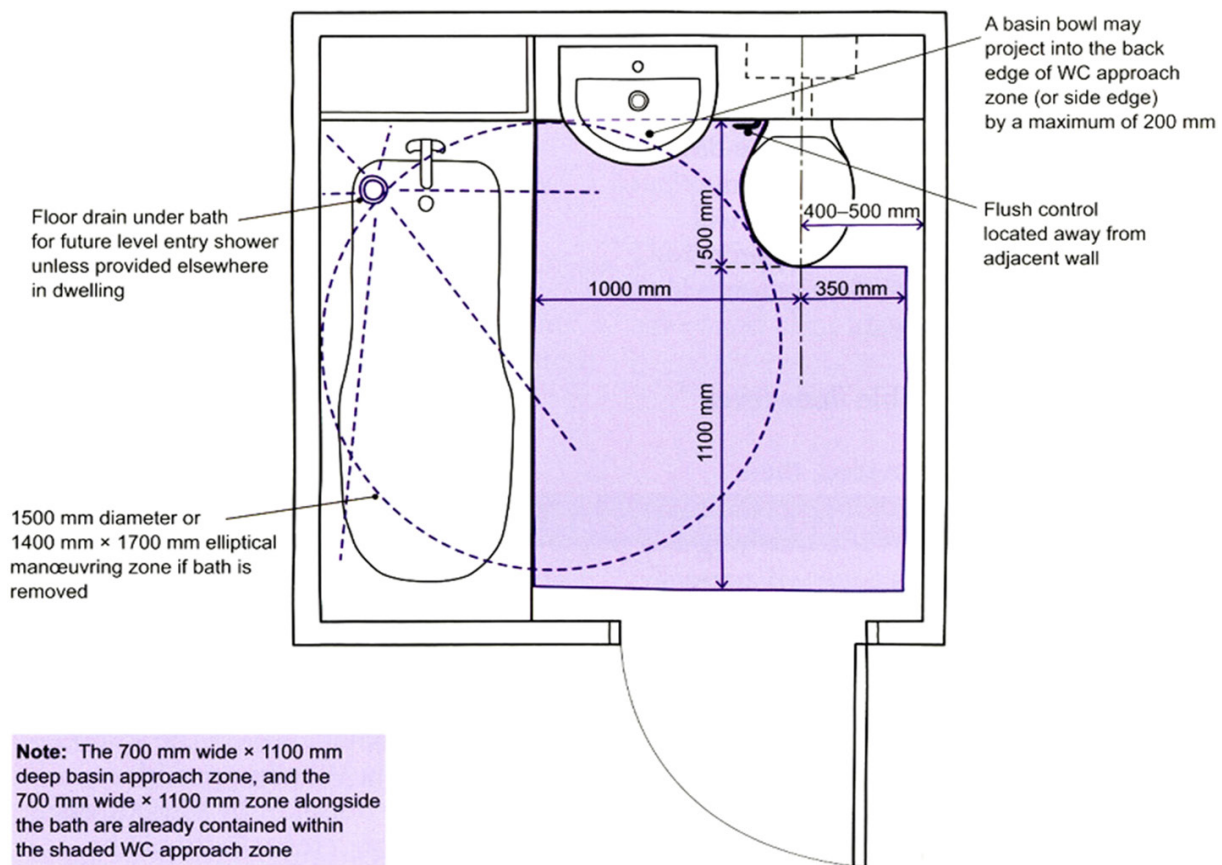


Fig. 13
Guidance for accessible bathrooms. From *Lifetime Homes Design Guide* (2011).

avoids referring to the social demands of the household and the lifestyle that can be achieved through precise arrangements of the dwelling programme. In other words, it avoids providing design criteria related to social functions inside and outside of the dwelling unit and infrastructures related to housing.

The absence of dimensional criteria for dwelling design was then reconsidered in a highly prescriptive approach that brought back some of the functional concerns of early modernism. This was carried out with the only purpose of creating more specific and detailed space standards, leading to the creation of the *Lifetime Homes Design Guide* (UK) in the early 1990's. The guide was to respond to more demanding technical requirements and provide accessibility to all spaces, which allowed dwellers to age in their homes (Fig. 13). Anticipating changing needs is therefore seen as a qualitative shift in the creation of housing standards. Based on this problem, the *Lifetime Homes*

Design Guide argues:

Good housing design is thoughtful, forward-looking design that maximizes utility, independence and quality of life, while not compromising other design issues such as aesthetics or cost effectiveness [...] Standard is an expression of inclusive design. It seeks to provide design solutions in general-needs housing that can meet the changing needs of the widest range of households.⁸

Based on this statement, standard dwelling design is a powerful means to ensure quality of life. This should not only account for dimensional problems, but also strategies that can answer to varying de-

8 Habinteg Housing Association, *Lifetime Homes Design Guide* (London: BRE Press, 2011), p. 3.

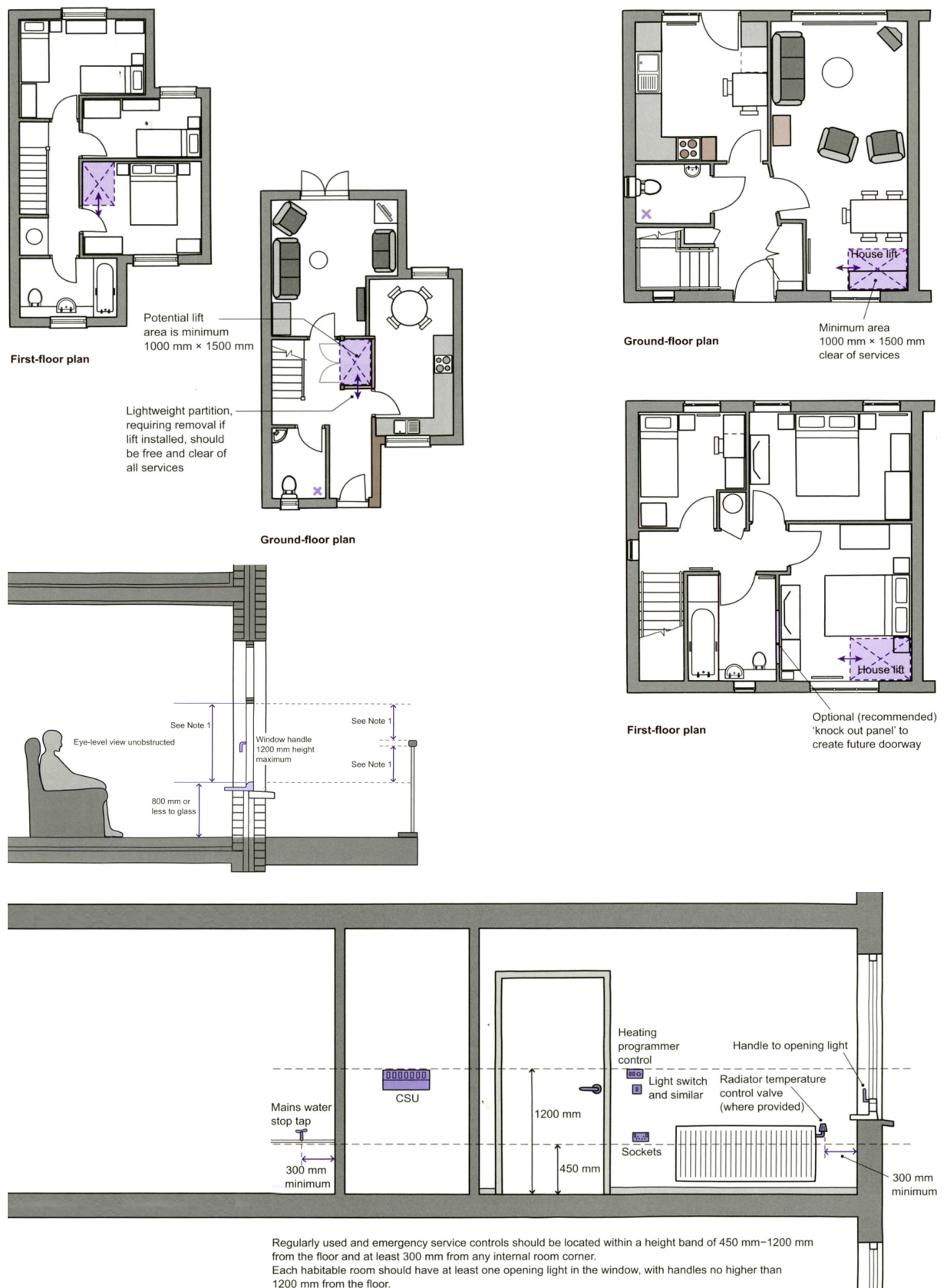


Fig. 14
Examples of technical guidance. From Lifetimes Homes Design Guide (2011).


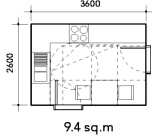
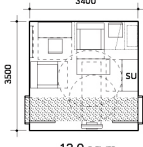
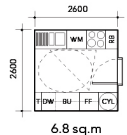
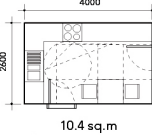
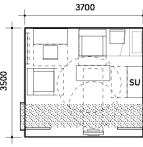
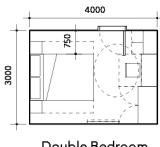
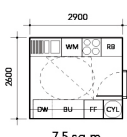
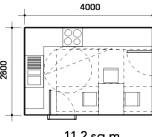
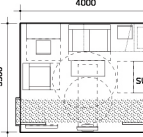
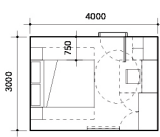
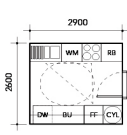
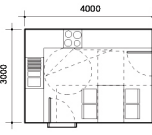
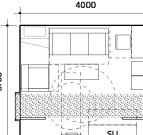
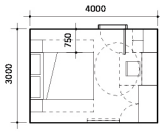
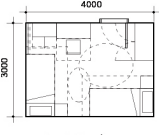
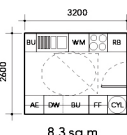
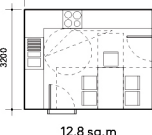
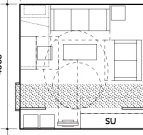


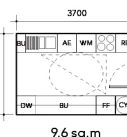
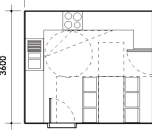

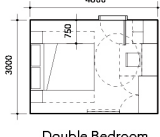

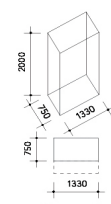
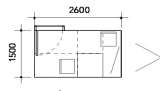
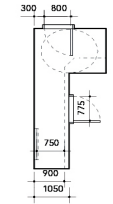
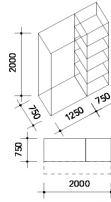
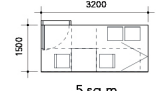
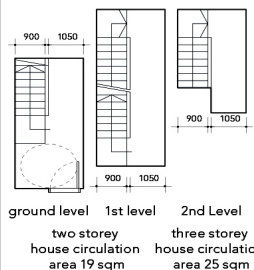
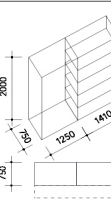
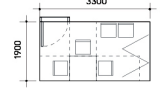
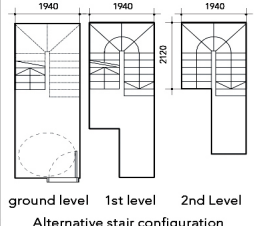
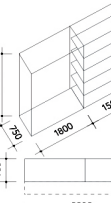
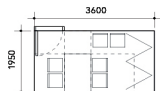
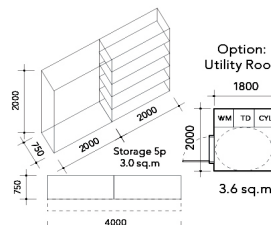

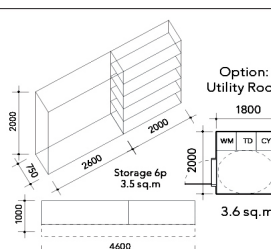
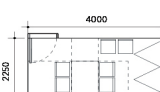
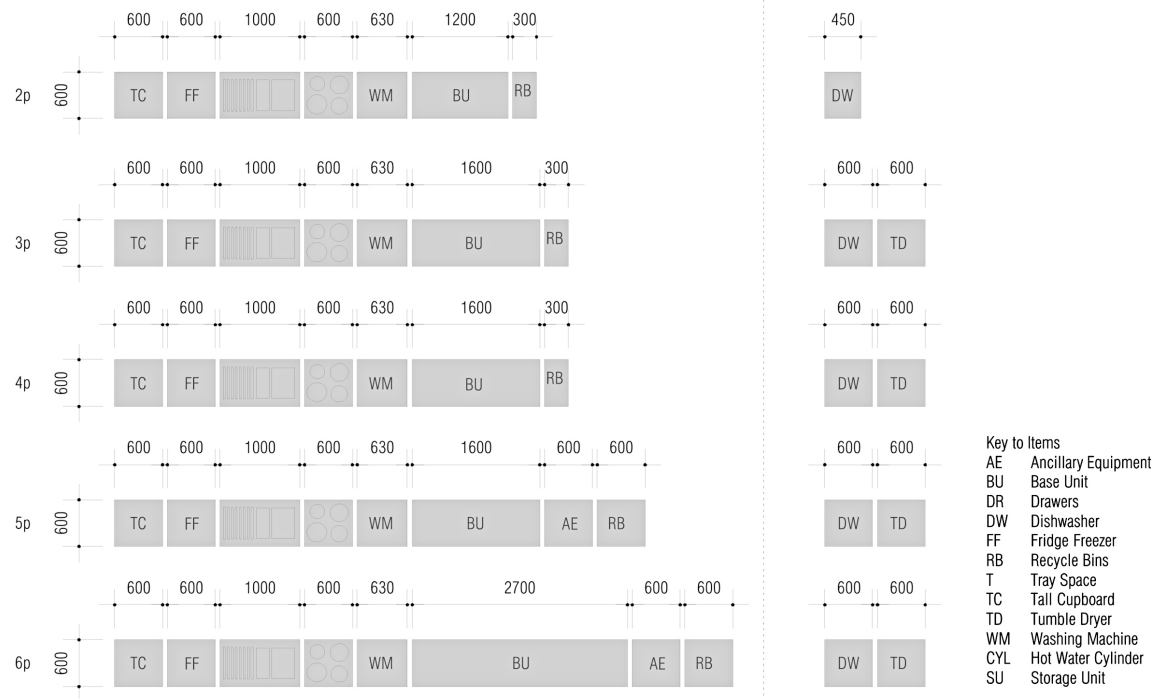
	Kitchen *see key to kitchen items	Dining dining area calculated as difference of kitchen dining and kitchen	Living	Combined Kitchen/ Living/Dining:	Double	Twin
1-person	 6.2 sq.m	 9.4 sq.m dining area 3.2 sq.m	 12.0 sq.m	21 sq.m		
1-bed, 2-persons	 6.8 sq.m	 10.4 sq.m dining area 3.6 sq.m	 13.0 sq.m	23 sq.m	 Double Bedroom 12.0 sq.m	
2-bed, 3-persons	 7.5 sq.m	 11.2 sq.m dining area 3.6 sq.m	 14.0 sq.m	25 sq.m	 Double Bedroom 12.0 sq.m	
2-bed, 4-persons	 7.5 sq.m	 12.0 sq.m dining area 4.5 sq.m	 14.8 sq.m	27 sq.m	 Double Bedroom 12.0 sq.m	 Twin Bedroom 12.0 sq.m
3-bed, 5-persons	 8.3 sq.m	 12.8 sq.m dining area 4.5 sq.m	 16.0 sq.m	29 sq.m	 Double Bedroom 12.0 sq.m	 Twin Bedroom 12.0 sq.m
4-bed, 6-persons	 9.6 sq.m	 14.4 sq.m dining area 4.8 sq.m	 17.0 sq.m	31 sq.m	 Double Bedroom 12.0 sq.m	 Twin Bedroom 12.0 sq.m

Fig. 15
Space standards (taken from Lifetime Homes). From the London Housing Design Guide (2010).

Storage/Utility	Outdoor Amenity Space	Net Internal	Circulation:	Partition walls allow 5 %	GIA [exc. amenity]	Circulation Layouts Stairs for 3m floor to floor height 15 steps 230/200
 <p>Storage 1p 1 sq.m</p>	 <p>4 sq.m</p>	33.5 sq.m	1 Level Flat + 1.5 sq.m	2 sq.m	37 sq.m	 <p>one level flat circulation area 6.5-12.5 sqm</p>
 <p>Storage 2p 1.5 sq.m</p>	 <p>5 sq.m</p>	41 sq.m	1 Level Flat + 6.5 sq.m	2.5 sq.m	50 sq.m	 <p>ground level 1st level 2nd level two storey house circulation area 19 sqm three storey house circulation area 25 sqm</p>
 <p>Storage 3p 2.0 sq.m</p>	 <p>6 sq.m</p>	51.5 sq.m 54.5 sq.m	1 Level Flat + 6.5 sq.m 2 Storey House + 19 sq.m	3 sq.m 3.5 sq.m	61 sq.m 77 sq.m	 <p>ground level 1st level 2nd level Alternative stair configuration</p>
 <p>Storage 4p 2.5 sq.m</p>	 <p>7 sq.m</p>	58 sq.m 60 sq.m	1 Level Flat + 8.5 sq.m 2 Storey House + 19 sq.m	3.5 sq.m 4 sq.m	70 sq.m 83 sq.m	<p>Variations</p> <p>3-bed, 4-persons 1 level flat: 70-12+(8x2) = 74 sq.m 2 storey house: 83-12+ (8x2) = 87 sq.m 3 storey house: 87+6 = 93 sq.m</p> <p>3-bed, 6-persons 1 level flat: 99-16+12 = 95 sq.m 2 storey house: 107-16+12 = 103 sq.m 3 storey house: 113-16+12 = 109 sq.m</p> <p>4-bed, 5-persons 1 level flat: 86-12+(8x2) = 90 sq.m 2 storey house: 96-12+ (8x2) = 100 sq.m 3 storey house: 102-12+ (8x2) = 106 sq.m</p>
 <p>Option: Utility Room 1800</p> <p>Storage 5p 3.0 sq.m</p> <p>3.6 sq.m</p>	 <p>8 sq.m</p>	71 sq.m 72 sq.m 72 sq.m	1 Level Flat + 10.5 sq.m 2 Storey House + 19 sq.m 2 Storey House + 25 sq.m	4.5 sq.m 5.0 sq.m 5.0 sq.m	86 sq.m 96 sq.m 102 sq.m	
 <p>Option: Utility Room 1800</p> <p>Storage 6p 3.5 sq.m</p> <p>3.6 sq.m</p>	 <p>9 sq.m</p>	81.5 sq.m 82.5 sq.m 82.5 sq.m	1 Level Flat + 12.5 sq.m 2 Storey House + 19 sq.m 2 Storey House + 25 sq.m	5.0 sq.m 5.5 sq.m 5.5 sq.m	99 sq.m 107 sq.m 113 sq.m	<p>*Key to Kitchen Items</p> <p>AE Ancillary Equipment BU Base Unit CYL Hot Water Cylinder DR Drawers DW Dishwasher-optional FF Fridge Freezer RB Recycle Bins SU Storage Unit T Tray Space WM Washing Machine</p>

Kitchen furniture schedule



Dining space furniture schedule

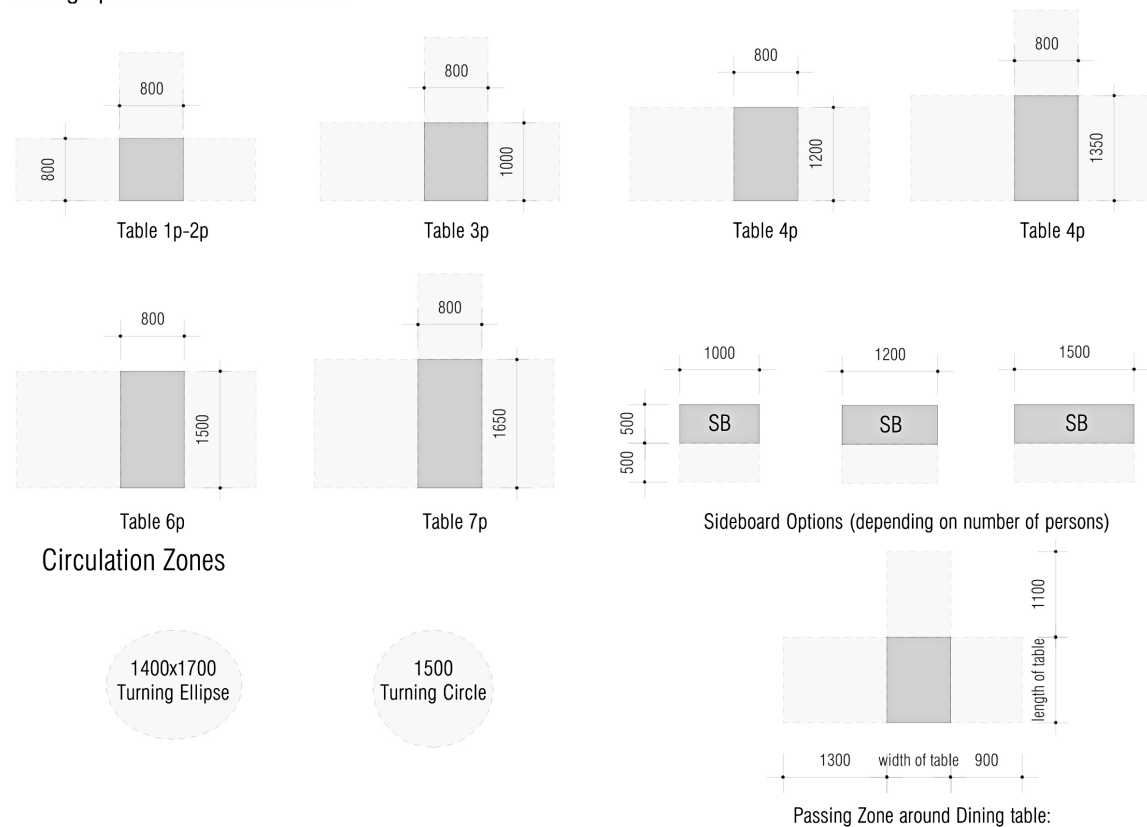
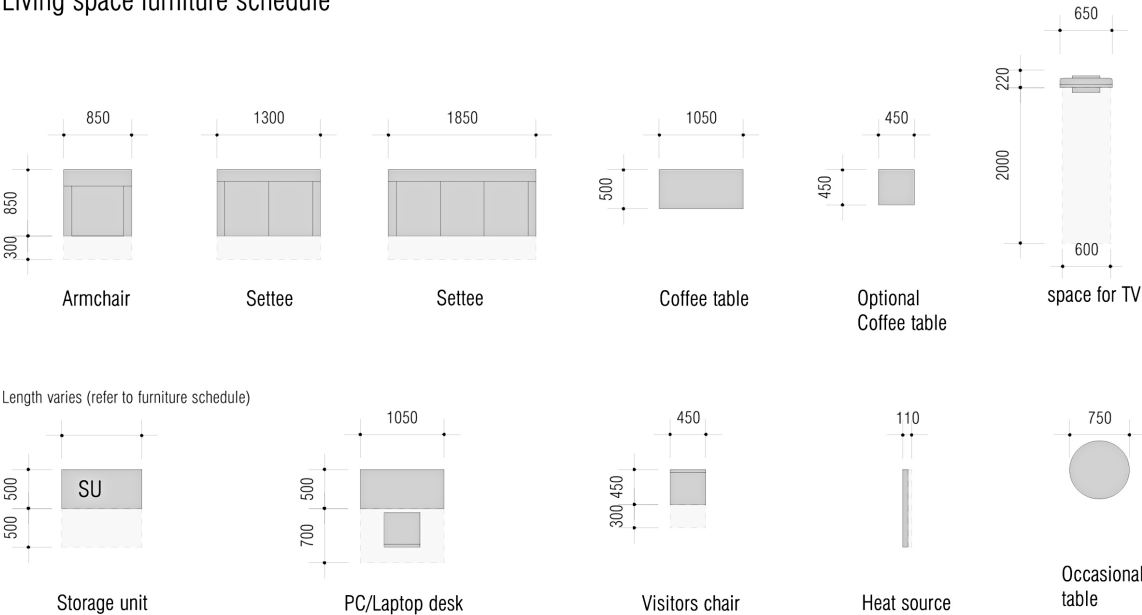
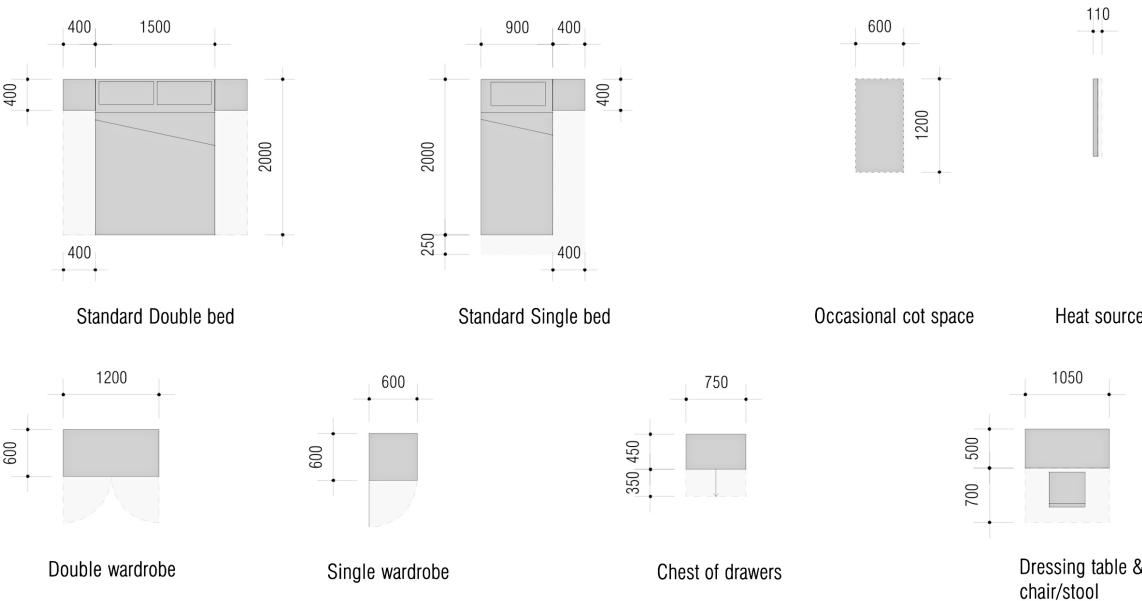


Fig. 16
Furniture schedule. From the London Housing Design Guide (2009).

Living space furniture schedule



Bedroom space furniture schedule



Activity Zones



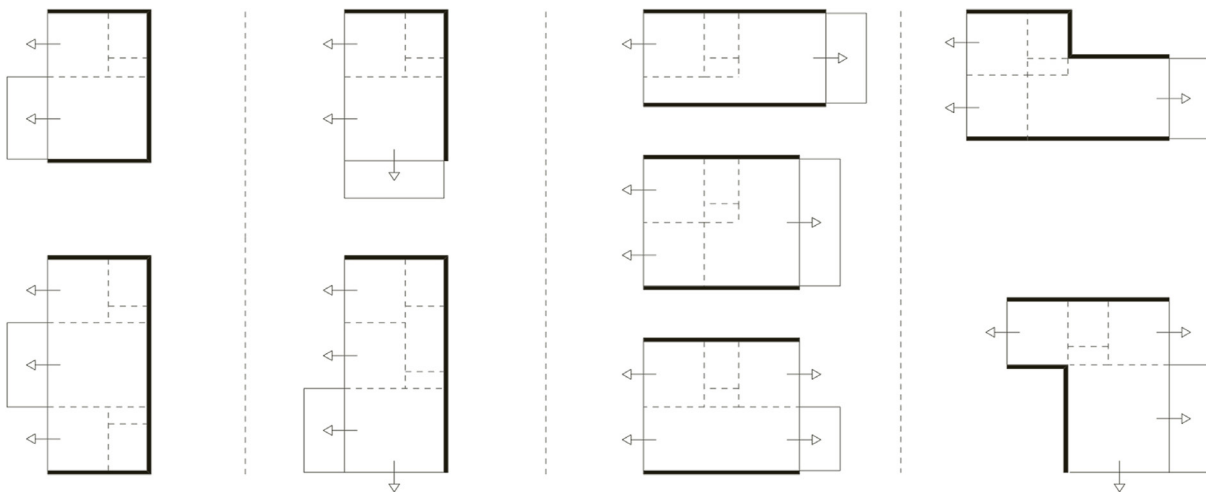


Fig. 17
Design criteria single, double and corner aspect arrangements. From the Good Solutions Guide to Apartments (2002).



Fig. 18
Different design criteria and examples of dwelling layouts. From the Good Solutions Guide to Apartments (2002).



Fig. 19
Strategies for flexible housing. From Good Solutions Guide to Apartments (2002).

mands. Although the *Lifetime Homes Design Guide* seems to have broad ambitions and is driven by long-term design concerns, the issue is that all demands have to do with physical problems, thus avoid any reference to social needs, which could question the 'standard' dwelling programme or raise other considerations capable of impacting the development of socially vulnerable households. However, none of these issues are addressed in the guide. The whole focus is instead on defining highly detailed standards, which are even more prescriptive than those in earlier housing design guides (Fig. 13, 14). The main reason for this is that most standards are based on ensuring wheelchair accessibility to all dwelling spaces. The outcome is therefore an increased quantitative consideration of dwelling standards. In fact, through *Lifetime Homes*, the analytical measuring of domestic space is now at its highest point. This is clear when looking at the current version of the *London Housing Design Guide* (UK, 2010). The way the dwelling design is framed is surprisingly contradictory. Even though it has a highly detailed section on space standards and furniture schedules (Fig. 15, 16), other design aspects mentioned in the guide – such as privacy, dual aspect, noise, floor and ceiling heights, and daylight and sunlight – are barely addressed. They are covered by short written design recommendations without any architectural examples.

By focusing only on isolated dwelling design instanc-

es, the problem is that although they can be individually efficient they might not be when combined. The paradox is that once all the prescribed standards are met, the outcome can be a cumbersome dwelling layout that lacks a rationale for the organization of rooms and their associated functions. There is also no advice on dealing with problems emerging from the application of proposed standards, such as the redundancy of circulations, main access point, strategic organization and location of bathrooms and services (laundry and storage areas), private versus public areas (bedrooms versus public rooms), and buffer zones, among others. Thus, it can be argued that in order to make standards meaningful and effective, they have to be thought of in relation to the strategic arrangement of the dwelling programme. This means going beyond the existing table of minimum dwelling sizes – defined according to the number of bedrooms and occupants – and asking for desirable relationships among different design requirements. That is to say, the dwelling programme should not be seen as a mere list of functions to fulfil, but as a primary design criteria that precedes and organizes the application of dwelling standards.

Following on this, the logical order through which standards are presented is another important aspect to consider. Instead of being a random compendium of standards, housing design guides should make the suggested decision-making processes intelligi-

ble. This is in a great extent possible by providing a clear scalar approach from the definition of individual elements to the creation of multiple assemblies. This is in fact one of the great weaknesses of the dwelling design section in the *Lifetime Homes Design Guide* and the *London Housing Design Guide*. In the first case, the guide is devoid of any scalar approach and is constantly moving from dwelling layouts to highly detailed elements and vice versa, which is highly confusing to the reader. In the second case, what is defined first are the main room arrangements and then their respective elements and associated requirements – a furniture programme that varies according to the dwelling size in the case of the living room and dining kitchen. In doing so, the latter becomes an appendix of the former, reinforcing the idea of the guide as a collection of independent design problems. The lack of concern about the role of design in both guides makes them appear more as a normative book of spatial requirements than a means to provide directions of good practice; something that should be the core mission of the design guide. If the main focus is not clear, the design guide is at risk of losing its purpose and could be replaced by a less complex regulatory document capable of enforcing space standards and other quantitative aspects of dwelling design.

One of the few recent housing design guides – although less ambitious in terms of social and economic organization of the country – that avoids adopting an entirely technical attitude towards the creation of standards is the *Good Solutions Guide to Apartments* (New Zealand, 2002). By providing graphic examples, it offers a range of design possibilities but no fixed solutions (Fig. 17, 18). This logic applies from dwelling parts to general layouts. One of the most remarkable aspects of this guide is the section on flexibility (Fig. 19). As the guide states:

Flexibility strategies generally focus on designing buildings that have a built-in potential to cope with change, rather than designing buildings that may be physically altered or adapted in the future. A likely consequence of buildings designed for flexibility is that they are likely to have a longer life before requiring demolition, thus conserving resources and encouraging sustainable prac-

tice.⁹

The guide asks for apartment designs with the ability to accommodate a wide range of occupants, needs, and functions. These can be different household structures, living and working arrangements, children and elderly mobility and access requirements, among others. While this guide understands flexibility as a strategy to meet different household demands, the way it addresses this does not answer to changing needs. It rather has to do with the adaptability and lifetime of buildings. This is clear when looking at proposed examples of flexible layouts, which can shrink or expand by modifying two dwellings at the same time. In spite of the *Good Solutions Guide to Apartments* failing to provide an effective answer to individual demands, it puts into question the organization of dwelling as something predictable. Recognising changing needs involves thinking about the dwelling beyond its dimensions and functions as fixed solutions. That is thinking of a design capable of accounting for multiple uses instead of furniture dimensions and the simplified idea of ‘user’.

The above must, however, avoid falling into a deterministic and therefore limited understanding of flexibility, as happens with the ones based on technical means. An example of this approach is the Schröder House by Gerrit Rietveld from 1924 (Fig. 20). A complex sliding panel system in the upper floor transforms the layout according to the changing needs throughout day and night. This way, it can become an open plan or a number of rooms that respond to specific uses. The problem of this design strategy is that, although it is flexible in spatial terms, it is not in functional ones. What is proposed is rather a highly rigid design solution that forces the transformation of spaces in order to carry out specific tasks. That is to say, opposite dwelling functions such as private and public ones cannot coexist due to each requiring the space of the other, which hinders using spaces in a manner that is different from what is prescribed by the plan.¹⁰

9 NSW Planning Department, *Good Solutions Guide to Apartments* (Auckland: North Shore City Council, 2002), p. 98.

10 Although the Schröder house is not an example for

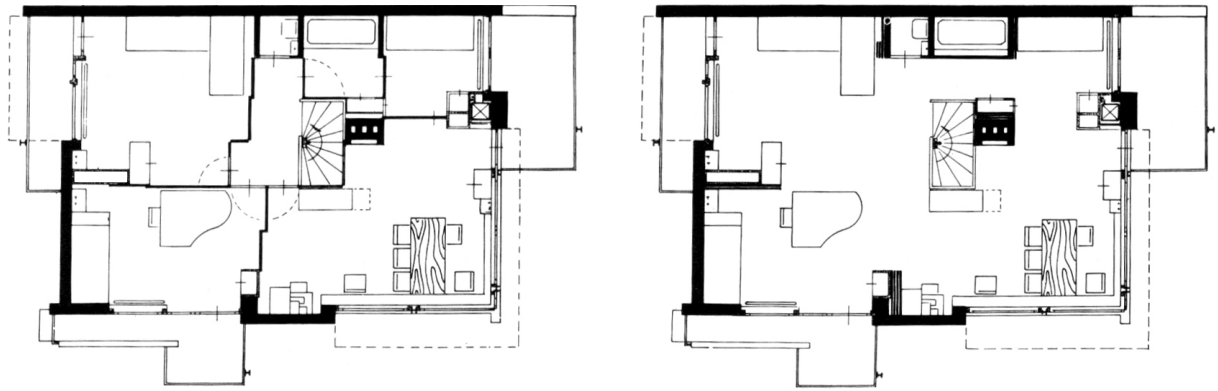


Fig. 20
Gerit Rietveld's Schröder House: first floor plan and its strategy of sliding walls. From *Words and Buildings: A Vocabulary of Modern Architecture* (2000).

This approach to flexibility is in fact applicable to a number of functionalist strategies that aim at proposing a highly 'efficient' use of space. Wall beds, sofa beds, folding desks, and sliding wardrobes, among others, are all mechanisms to transform the function of spaces that in most cases end up with a highly deterministic dwelling layout (Fig. 21, 22). In doing so, the 'user' is once again subject to a very predetermined form of living. This limitation can be understood through Canguilhem's idea of the normal. From that point of view, one can argue that dwelling solutions based on technical means define an ideal sequencing of uses that do not 'tolerate infractions' nor include a 'margin of tolerance' that could simultaneously respond to functions belonging to different natures such as sleeping and socializing (bedroom and living room), being both part of the normal. This idea of flexibility is only a possible solution when demands for space do not overlap, for example in dwellings for single persons. Otherwise, couples and families will always be fighting for the space that each individually demands.

We could then ask how to reconcile functional requirements, demographic changes, household transformations, and technological development through a single design framework. According to Jeremy Till this can be achieved by overcoming one-sided approaches

to dwelling design. On the one hand, these have to do with fixed and function-based dwelling programmes. On the other, they rely on dwelling standards as a means to standardize both the dwelling space and social demands. In his words, 'the issue with space standards is exactly that, they become standard, so that the only way that one understands space is through standardisation, and the way we standardize it is by measuring it'.¹¹ Instead of continuing to rely on that problem, he proposes a more balanced approach based on conceiving the dwelling as an agglomeration of hard and soft spaces. Hard space determines the way in which it can be used, whereas soft space is unspecified and allows several uses. That is to say, the first only responds to a fixed function and the second to multiple ones.

A clear example of soft space is the Britz Housing (1925) by Bruno Taut (Fig. 23). In this project, the dwelling is defined by three service spaces (kitchen, bathroom and pantry) and a set of rooms with indeterminate functions (soft spaces). This means that the disposition of the dining room and living room – traditionally arranged in a fixed and hierarchical area of the plan – can vary according to different needs. Even more, these functions could not necessarily exist as such. Instead, it is the dweller the one who signifies

general use – as it was the outcome of a very particular collaboration between the architect and the client – it embodies a highly functionalist approach to flexible dwelling design.

¹¹ Jeremy Till, 'Soft Space', *RIBA Research Symposium 2008: Space at Home* (2008) <<https://www.architecture.com/Files/RIBAProfessionalServices/ResearchAndDevelopment/Symposium/2008/JeremyTill.pdf>> [accessed 30 November 2015] (p.11).

List of Artifacts:

Sofa-bed
Mobile light
Rotating desk and book shelf
Walk-in closet
Luggage shelf
Cabinet
Shower cubicle
Washbasin
Toilet
Sliding CD/DVD shelf
Bathtub
Folding bed
Laundry shelf
Sliding TV wall
Kitchen
Refrigerator

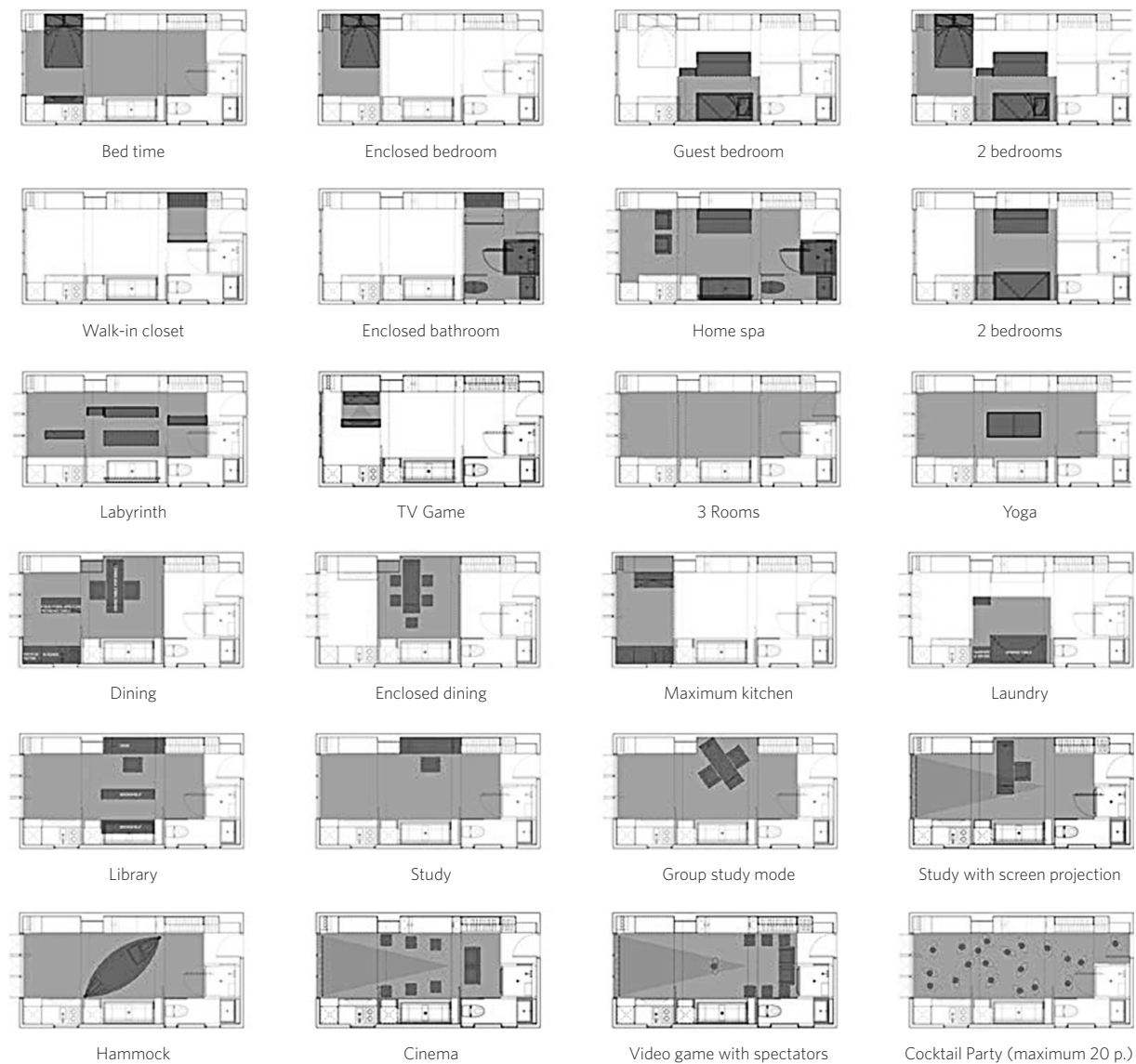
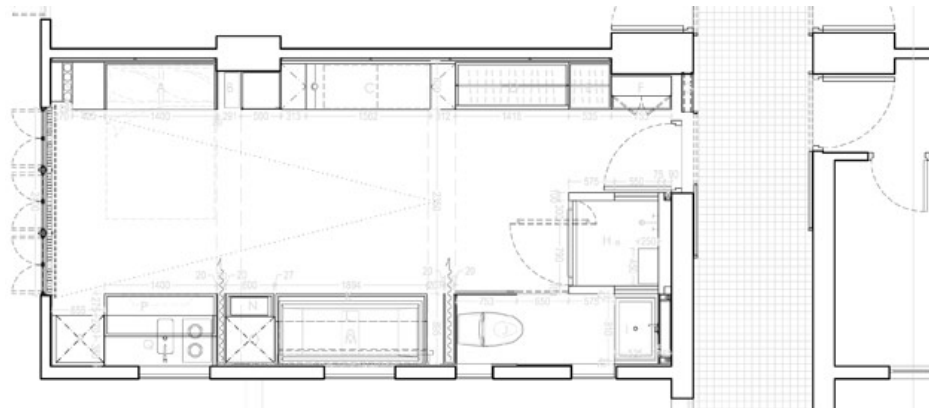


Fig. 21 - 22

Recent example of a micro flat by Gary Chang that aims at responding to a wide range of functions by means of a flexible design strategy based on technical means (2008). From My 32 m² apartment: A 30-Year Transformation.

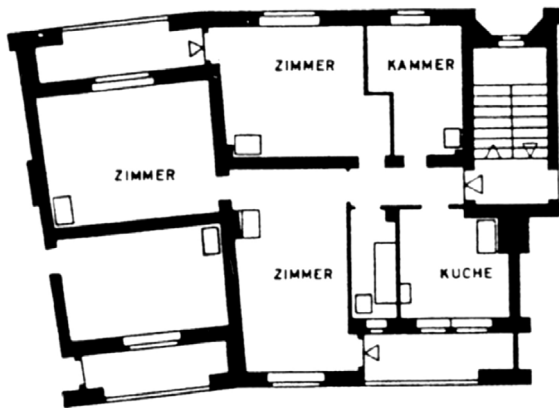


Fig. 23
Britz Housing by Bruno Taut: typical layout. From 'Soft Space',
RIBA Research Symposium 2008: Space at Home (2008)

soft spaces by providing an open function to them. Such a freedom avoids reproducing conventional dwelling arrangements that fail to answer changing needs. Thus, if the concept of flexibility is understood as a strategy that creates neutrality instead of functionality, this can become a powerful means for dwelling design. This is because neutrality can answer issues of efficiency (quantity problem) – dealing for example with space or programmatic redundancy – and respond to changing demands, which are related to the very idea of the normal (quality problem), allowing therefore to develop life.

The Social as an In-Between Scale

Apart from answering physiological needs, a housing design guide should address more profound problems that have to do with the existential and political problems of dwelling, which, according to Teige, is essentially a social condition and its scope surpasses the boundaries of the housing unit. This challenge requires to account for collective functions or social mechanisms that could secure the development of individuals within society. Particularly, the ones living in vulnerable social conditions, for which setting a socio-educative framework is required. Elaborating this issue, *The Policing of Families* by Jacques Donzelot explains how the family, historically defined as an autonomous and private political entity, became a mechanism of governance and public interest

since the eighteenth century. The work particularly examines the transformation of power relationships between the family and the French state. Donzelot describes how the progressive fragmentation of the family led the state to introduce different mechanisms of surveillance of marginalized people in the domestic realm. This led to the emergence of what he defines as 'the social', which is understood as a domain of state interventions that blurs the line between private and public milieus. This allows the state to move from a model based on the government of families to one that governs through the structure and operational logic of the family itself. That is to say, the family becomes a social unit, subject to a constant state surveillance that is asked to perform specific duties – in the interior of family life – which are considered of public interest.

One of the main arguments by Donzelot centres on the deterioration of the family as a coordinated network of dependences and complementarities that requires an administrative head. This manifests itself in the lack of attention by parents on the development of children. It leads the state to intervene in the broken educational network, in order to protect the child from problems of abandonment – either by the total absence of an educational figure at home or by externalising educative tasks to people with no commitment or ability to perform that role – and exploitation. To do this, the state created a socio-educative alliance with parents. Specifically, with the mother being regularly advised to promote health, education and personal development at home. Donzelot describes a large range of social programmes created to deal with this issue, such as parents' associations, philanthropic and charitable societies, religious institutions, children courts and hospices, among others. Through these, what is taught in public education is not limited to the public sphere and needs a counterpart in the private realm that translates into a 'revalorization of educative tasks'.¹²

By means of socially driven programmes, the state was able to introduce educational principles into fam-

¹² Jacques Donzelot, *The Policing of Families* (London: Hutchinson, 1980), p. 21.

ily life, which was seen as a mechanism for the normalisation of the family and therefore as a strategy of social reform. This idea of the normal is different from the one that housing design guides have proposed so far. They have understood the normal through average demands, which are framed only through physical aspects that mainly account for problems of dimensionality, leaving aside social considerations. Donzelot instead understands the concept of normal in terms of the ability of an individual to participate and develop within a political community. That is, it is a collective problem.

Although the school is a role model that determines normal and abnormal behaviours, Donzelot argues that it is not able to correct all social pathologies such as the ones coming from the private domain. The family is instead considered the origin of deficient formative processes. This explains the need of the state to govern through programmes of social control at the microscale of the family. Once these come into action, the family is required to watch and take care of their children, if it does not want to be sanctioned by the state. This way psychology substitutes legal punishment and transforms the family into a therapeutic entity whose main task is to prevent problems of social adaptation. By subjecting private habits to public scrutiny, the family becomes an open and hybrid space made up of conflicting desires and powers. It creates public norms and private principles instead of a strict law. To Donzelot, 'the social' is therefore ultimately a sum of individual and subjective experiences organized within an environment of collective learning. It is a formative process of multiple scales and social layers that understands the family as its primary social unit.

Exposing family life to public enquiry can be a powerful means to install principles of social behaviour. But this strategy can also be understood as a highly prescriptive and cumbersome system of governance due to the state's requirement for a large number of mechanisms of surveillance in order to put forward a specific socio-political agenda. However, one can argue that social practices around family education should not necessarily happen under a formal (state-driven) framework. To the contrary, these practices can be informally replicated as happened in

Chile during the first half of the nineteenth century. In this context, one of the most remarkable examples were Family Talks (*Tertulias Familiares*). These were held in private houses or other facilities such as clandestine clubs – depending on the social class – and consisted of meetings among neighbours, friends or relatives, in which families could give an account for the education of their children on the one hand, and discuss about politics, culture, and business on the other (Fig. 24). Although Family Talks were an expression of a highly hierarchical social structure during that time, this social practice required a high commitment of families to the educational development of its members. Otherwise, they would not be respected by their peers.

From this example it is clear that self-organization can also generate socio-educative practices, which allows to think about a dwelling programme that comprises social functions. In relation to this idea it is possible to ask: what kind of socio-educative functions should be considered essential for dwelling design in contemporary society? There are a number of public programs that include activities that are mirrored at the domestic scale such as libraries (studying), nurseries (child care), parks (playing), and communal centres (socialization as the case of living rooms). However, when these activities have to be thought of in terms of a minimum dwelling, most of them are not considered, or when they are, do not fulfil their function adequately due to the lack of space. Based on this problem, it can be argued that the minimum dwelling cannot be understood by itself but through an intermediate (communal) facility – can be one or several facilities – between the private and public domain. These facilities can be both a space that fosters socio-educative practices around family education, and an agglomeration of domestic activities. By means of these externalized functions it is possible to decompress, as Teige suggests, the minimum dwelling programme, thus calling into question the traditional scopes of dwelling design.



Fig. 24
Family Talk in Santiago. Drawing by Claudio Gay (1840).

Neoliberalism and Sub-Standards

When the different aspirations of the housing design guide are brought to the context of Chile, it is necessary to consider that there are no documents providing qualitative design criteria or directions for good practice. Dwelling design is only normative. Its main aim is to ensure the basic requirements of a precarious minimum dwelling. This is defined through a short compendium of space standards and furniture sizes, which are a rudimentary version of the previous discussed housing design guide (Fig. 25). When applied, it produces a house of no more than 45m² and an inadequate dwelling programme unable of meeting the typical demands of a low-income family – usually consisting of 3 to 6 members. This way, the current regulatory framework for dwelling design fails in both producing qualitative design considerations, as well as setting norms capable of responding to minimum space requirements.

That means one has to first challenge existing design criteria applied to the housing provision and produce a different dwelling arrangement. Second, one also has to question the political framework that avoids securing social welfare to low-income groups. Although it can be argued that the answer to that problem can be to increase the amount and quality of low-income housing standards – leading to higher public spending in housing and therefore a greater state commitment to its provision – the main obstacle is the neoliberal basis of housing policy. This limits the involvement of the state in social welfare issues and thus hinders major transformations of current housing standards.

The way that neoliberal ideology defines the Chilean model of housing provision can be explained through four key concepts. First, at an economic level, the private housing sector and its free competition system is understood as the main means to respond to social demands. That was achieved by ensuring general access to home ownership and thus creating the necessary conditions for market competition. That is to say, all housing demands are met in the same com-

petitive market, regardless of the financial limitations by low-income groups.

The second concept has to do with providing a legal framework to ownership. This idea is clearly reflected in the Political Constitution of Chile that states: ‘the state recognizes and defends the intermediate groups through which society organizes and structures itself and guarantees them the adequate autonomy to fulfil their own specific objectives’.¹³ Based on this statement, the problem was not to ensure general access to welfare but to make the whole society compete and pay in the same way for the services that each individual considers appropriate – pretending to give freedom of choice to home owners. This way, the main problem was to establish regulatory means by which the financial difficulties of low-income groups could be overcome. In other words, to integrate those who cannot afford housing through subsidies into the market.

From this problem a third concept emerges, which is understood through the so-called ‘principle of subsidiarity’.¹⁴ The far right party Independent Democratic Union (UDI) – which supported and provided a political ideology to the military dictatorship – defines this principle in the following way:

Through the principle of subsidiarity it is the duty of the state to assume those needed activities clearly convenient for the country that, being the responsibility of individuals, in practice cannot be undertaken. This function of the state – particularly in key areas of the country – has to be exercised in such

13 Political Constitution of Chile, *Chapter I: Bases of Institutionalality* (1980) <https://www.constituteproject.org/constitution/Chile_2014?lang=en> [accessed 18 November 2015] (article 1 of 129)

14 This principle applies to all social welfare services provided by the state.

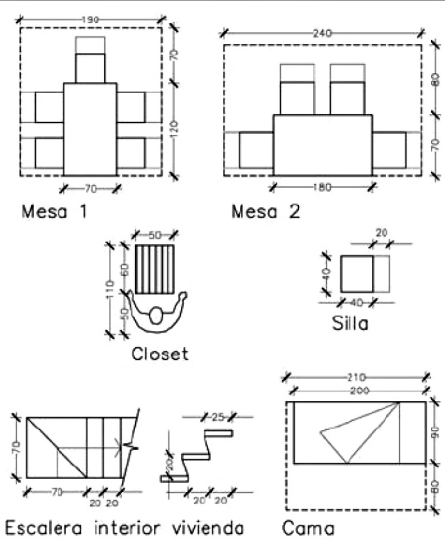
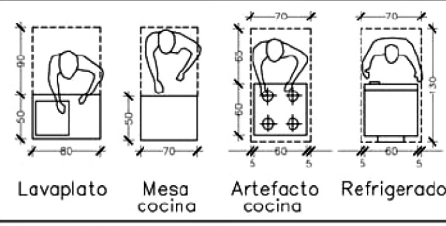
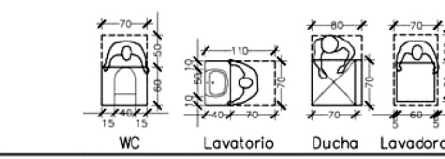
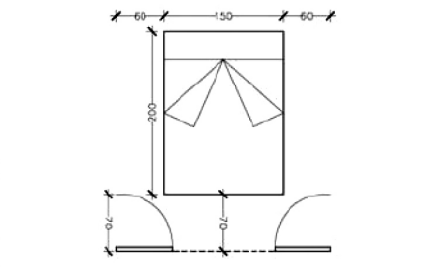
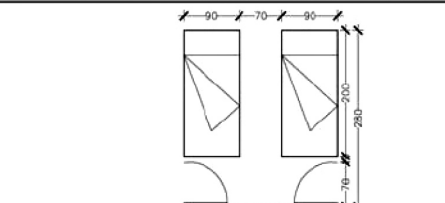
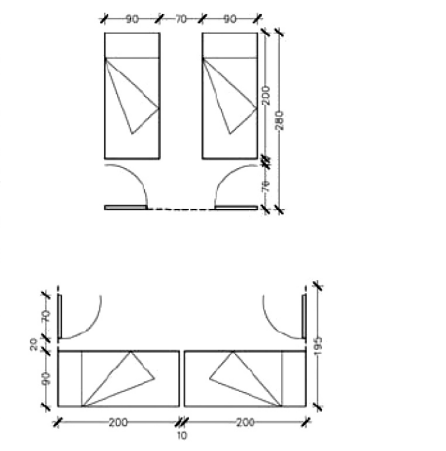
Comedor	1 nesa comedor para 4 personas	Cocina	1 lavaplate 1 mesa cocina 1 artefacto cocina 1 refrigerador
Estar	1 cama	Dormitorio 1	1 cama matrimonial
Vivienda	4 closets	Dormitorio 2	2 camas individuales en planta
COMEDOR – ESTAR		COCINA	
 <p>Mesa 1</p> <p>Mesa 2</p> <p>Closet</p> <p>Escalera interior vivienda</p> <p>Cama</p>		 <p>Lavaplate</p> <p>Mesa cocina</p> <p>Artefacto cocina</p> <p>Refrigerador</p>	
BAÑO		DORMITORIO 1 Cama Matrimonial	
<p>Baño</p> <p>1 W.C 1 Lavatorio 1 Ducha o Tina 1 Lavadora</p>  <p>W.C</p> <p>Lavatorio</p> <p>Ducha</p> <p>Lavadora</p>			
Alternativa Dormitorio-Proyecto Ampliacion		DORMITORIO 2 2 camas 1 plaza	
			

Fig. 25

Chilean rudimentary version of the housing design guide by Ministerio de Vivienda y Urbanismo. From Cuadro Normativo (art. 19 DS 174).

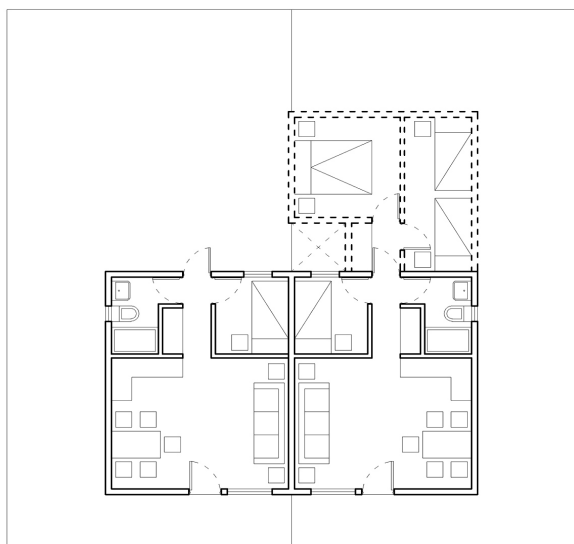


Fig. 26
Basic Dwelling Programme.

a way that individuals can be encouraged to address these activities or increase their initiative on them.¹⁵

According to this definition of subsidiarity, state assistance should always be as little as possible, regardless of urgency or demand. The state should only intervene when the private market fails to answer social demands. Translating this into housing policy, the provision has to be minimal but enough to allow low-income groups to access home ownership. That is, the minimum is not determined by the need to secure a 'standard of living' but by budgetary constraints that are, in principle, insufficient to pay for a dwelling solution capable of satisfying typical household needs. In fact, through the principle of subsidiarity, the state's responsibility is not to solve the 'private' problem of housing, but rather to encourage individuals to improve their living conditions by themselves. Housing is therefore primarily understood as a good that has to be attained through savings. However, when it comes to families with limited or no savings,

15 Unión Democrática Independiente (UDI), *Doctrina y Principios* [Doctrines and Principles] (1991) <http://www.udi.cl/website/contenido.php?S=7&SC=6&C=6#principio_3> [accessed 19 May 2014] (principle 3 of 23) [author's translation from Spanish].

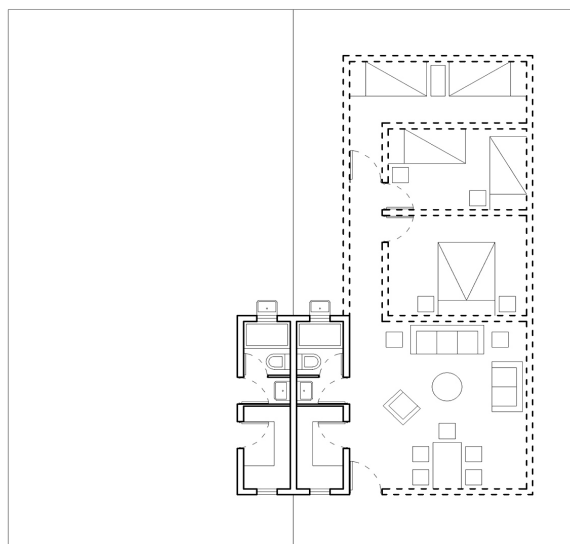


Fig. 27
Plots with Sanitary Infrastructure Programme.

the state provides a subsidy, which allows buying a house in the private market. Thus, 'the construction and financing of housing is in charge of the private sector and the government is only a facilitator'.¹⁶

The fourth and last concept is about the quality of provision. Due to the state transferring total responsibility of housing provision to the private sector, housing standards are subject to negotiation according to profit expectations by private developers.¹⁷ That is, the state assumes no responsibility for the deficient and changing quality of provision.

Based on these four concepts, the state has created a housing policy that – despite minor changes in the last few years – has remained the same since its

16 Ministerio de Vivienda y Urbanismo, Gobierno de Chile, Chile, *Un siglo de políticas de vivienda y barrio* [Chile, A century of housing policies and neighbourhood] (Santiago: Editorial Pehuén, 2004), p. 185 [author's translation from Spanish].

17 According to Fernando Atria, although the state has the responsibility to provide a legal framework when two private agents are negotiating in favour of their particular interests, those regulatory conditions cannot be the same when the state is one of the parts. Thus, in private agreements, each part has to safeguard its own interests, assuming the costs of wrong decision making. However, if the state operates as a private agent, it is at risk of paying for the costs of a bad negotiation, which has a direct impact in the quality of provision.

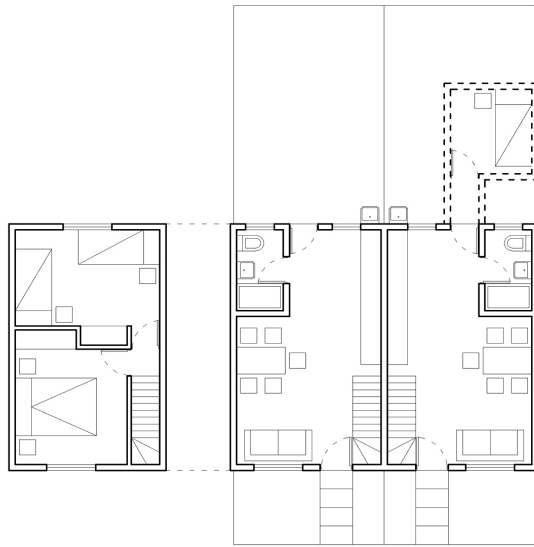


Fig. 28
Progressive Housing Programme.

implementation in the early 1980's. This becomes clear when looking at the early housing programmes, which created a sub-standard design for the minimum dwelling that persists until today. The first was called *Basic Dwelling Programme* and provided a subsidy that funded a house of around 34m² within a plot of 100m² that should accommodate a front yard and back yard (Fig. 26).¹⁸ The dwelling programme was designed for a family of 4 or more members, consisting of 1 bedroom, 1 bathroom, and 1 larger room with a kitchen, dining table and living room/sleeping area. Acknowledging the insufficient provision of space, the dwelling design, however, had to allow for future extension. This had to consider at least one more room, so parents and children could have their own spaces. Despite the few design requirements of the *Basic Dwelling Programme*, the state implemented a more radical housing scheme called *Plots with Sanitary Infrastructure Programme* (Fig. 27). Consisting of 6 to 8m² cabins, this only provided a kitchen, 1 bathroom, and laundry area. Thus, the minimum dwelling ceased to be a space to dwell, being now understood as the starting point for a self-built and self-financed house. This could then eventually match the standard of the

18 The subsidy paid for the 75% of the house and the rest came from family savings or bank loans.

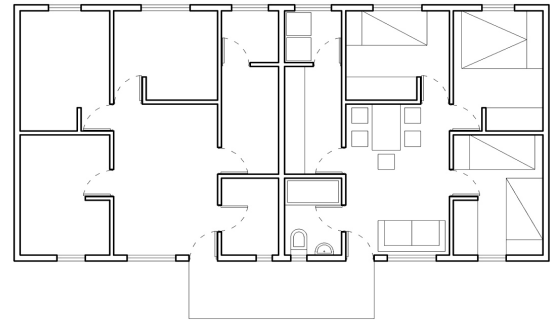


Fig. 29
Rethinking of the Basic Dwelling Programme.

previous *Basic Dwelling Programme*, once finished by its owners, or so it was envisioned.¹⁹

These first housing programmes can therefore be understood as a literal translation of the principle of subsidiarity. What is provided by the state is not a dwelling solution as such, but a framework that forces households to overcome their financial limitations – in theory achieved by forcing them to participate in the economic structure of the country. In doing so, families should be able to afford the needed extension and thus complete a 'basic' housing solution. The problem, however, is what the housing policy understands as minimum dwelling. This mainly focuses on one consideration alone, which is achieving a 'standard' dwelling programme corresponding to a 3-bedroom house. Thus, the policy does not even set minimum quantitative criteria such as space standards or an expected overall dwelling size that includes the completion of the extension. Understood from Teige's point of view, the proposed housing barely accounts for the most basic problem of dwelling, which is the one re-

19 The programme was understood as the most expensive and complex part of a house due to the need of facilities for gas, water, sewerage and electricity. Thus, the inhabitants should have to build the easiest part, which is basically a living room and bedrooms.

lated to biological subsistence (minimum moriendi). Because of this, the application of the *Basic Dwelling Programme* and the *Plots with Sanitary Infrastructure Programme* became highly problematic housing solutions. The imperative need of families to have enough space to dwell forced them to extend their houses indiscriminately both horizontally and vertically.²⁰ In doing so, the expected spatial limits of the house were in most cases transgressed, making use of the front yard and back yard, lacking design criteria for adequate lighting, ventilation, and the spatial organization of the programme.

After returning to democracy in 1990, the state committed to improving the quality of the low-income housing programmes. However, the following ones produced nothing more than a slightly larger version of the first schemes, by providing a clearer idea of the final dwelling configuration. On the one hand, the *Progressive Housing Programme* delivered a 2-bedroom house of 40m², allowing for a future extension in a small backyard that limited the possibilities of informal dwelling extensions (Fig. 28). On the other, an updated version of the *Basic Dwelling Programme* provided family flats of around 42m² (Fig. 29). Within this small area, the aim was to accommodate a more conventional dwelling programme. To do that, the *Basic Dwelling Programme* ignored the already insufficient space standards and decreased all room sizes in order to provide 3 bedrooms, 1 bathroom, living-dining room, kitchen, and a laundry area. The outcome of this condensed dwelling scheme was high levels of overcrowding due to the impossibility of extending the flats. In spite of that, the need of people for more space led them in many cases to build informal structures hanging from the outer walls, thus becoming an unregulated housing programme.

Rethinking Substandard Dwelling Design

In 2004, as a response and criticism to the inade-

quate housing programmes since the 1980's, the architecture studio Elemental was created. This studio significantly influenced both the state agenda and academic discussion regarding questions of minimum provision. The main concern of Elemental is the space standards enforced by the rudimentary version of the housing design guide, which fails to answer household demands. But instead of arguing for a different design framework, Elemental accepts the regulatory and budgetary limitations of low-income housing and proposes a design strategy that rethinks the way standards are applied. The architects explained the problem and proposed strategy in the following way:

Any of us in a middle-class family can live reasonably well in a house of between seventy and eighty square meters. But what if there is not enough money? What if there are insufficient private savings or access to a mortgage or public subsidies to pay for a middle-class standard? If the money can only pay for around forty square meters, instead of thinking of that size as a small house, why don't we consider it as half of a good one? When the problem is reframed by looking at forty square meters as half of a good house instead of a small one, the key question is: which half do we do? We thought the best thing was to do the half that a family was unlikely to do well on its own [...] when there is not enough money, an alternative to reducing (size and quality) is to frame the problem as incremental housing. Under that lens, self-construction can stop being seen as a problem and start being considered as part of the solution [...] the initial form has to anticipate how self-construction will allow a family to achieve a middle-class standard.²¹

At first glance, Elemental seems to have similar motivations to those by Parker Morris. That is, the quality of a dwelling is mainly determined by its overall size, which is a purely quantitative design criterion.

20 Due to the great housing deficit during the 1980's, the low-income household use to be composed of large groups, which ranged from grandparents to grandchildren, thus requiring 4 or more bedrooms per house.

21 Aravena, Alejandro, Andres Iacobelli, *Elemental: Incremental housing and participatory design manual* (Ostfildern: Hatje Cantz, 2012) p.17.

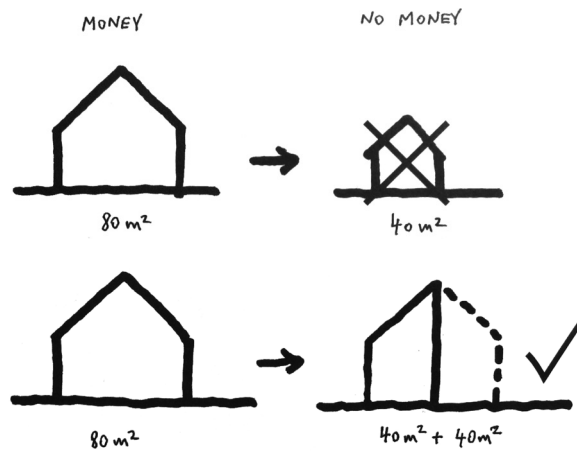


Fig. 30
Diagram of dwelling design strategy by Elemental. From Elemental: Incremental Housing and Participatory Design Manual (2012).

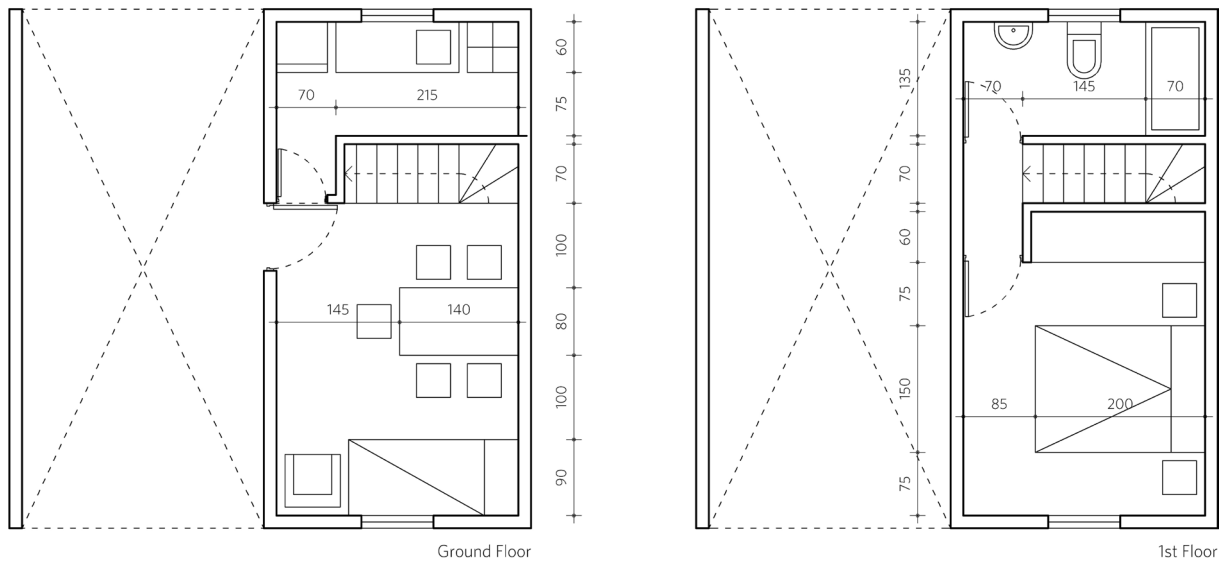


Fig. 31
Half-house dwelling scheme by Elemental (40 m²).

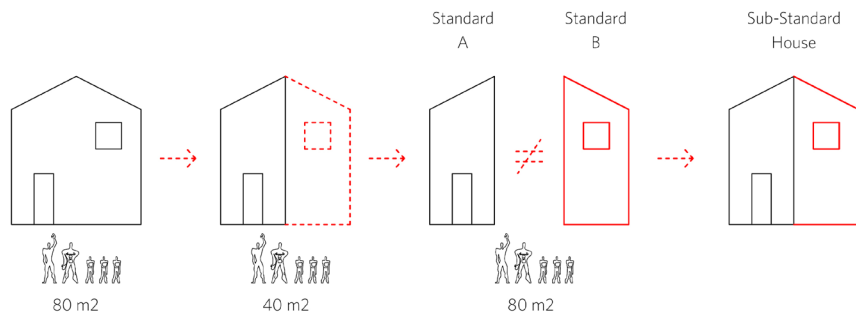


Fig. 32
Diagram of Elemental's sub-standard housing proposal.

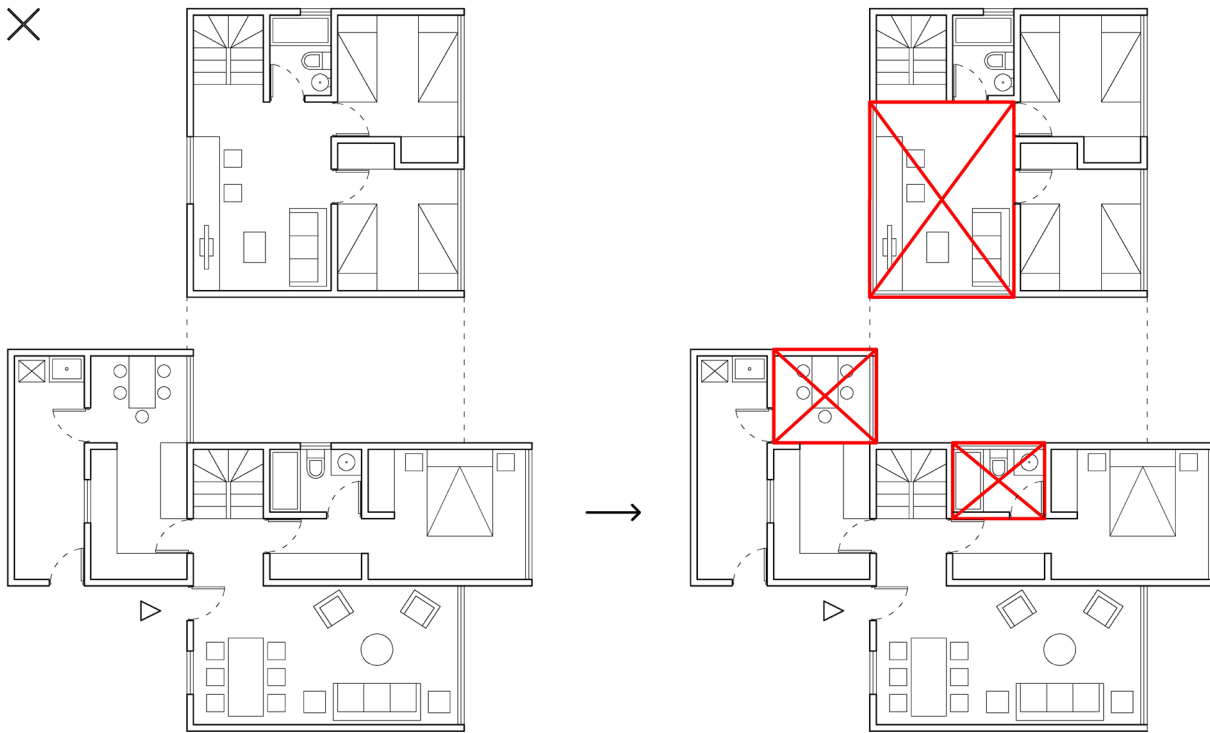


Fig. 33
Example of an aspirational mid-income dwelling programme and its conventional reinterpretation for low-income housing.

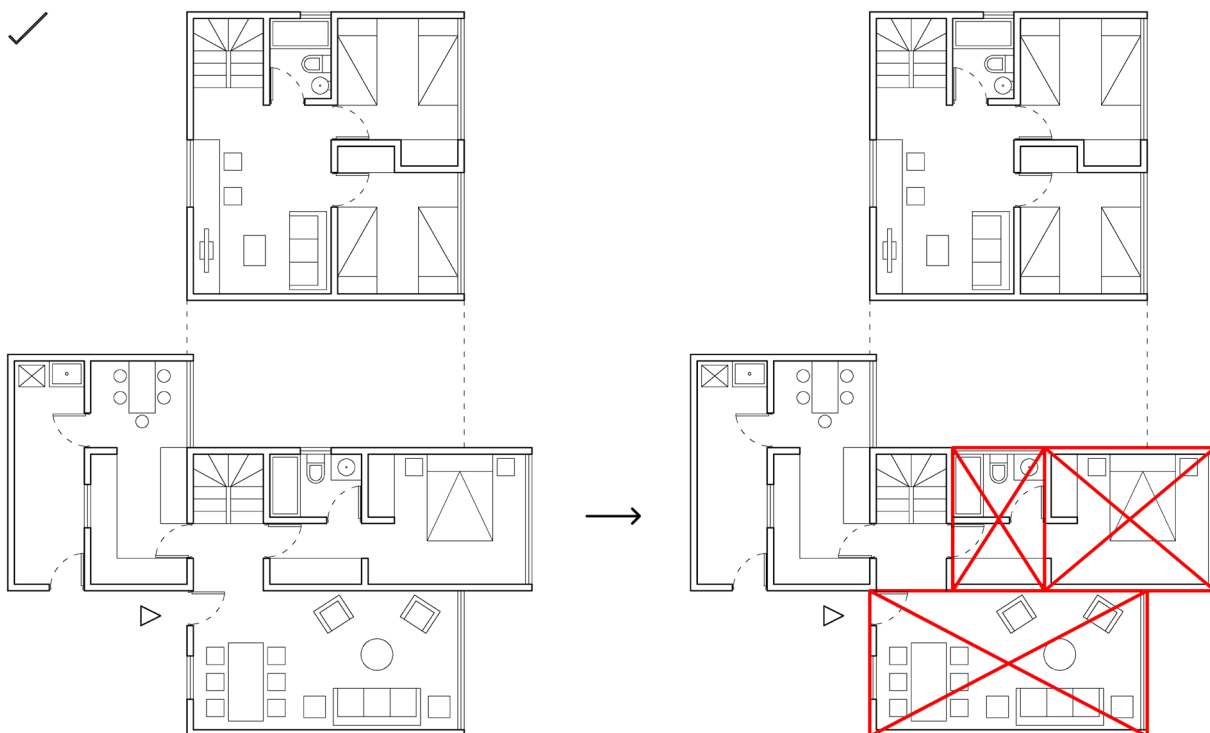


Fig. 34
Example of an aspirational mid-income dwelling programme and its proposed reinterpretation according to current living patterns.

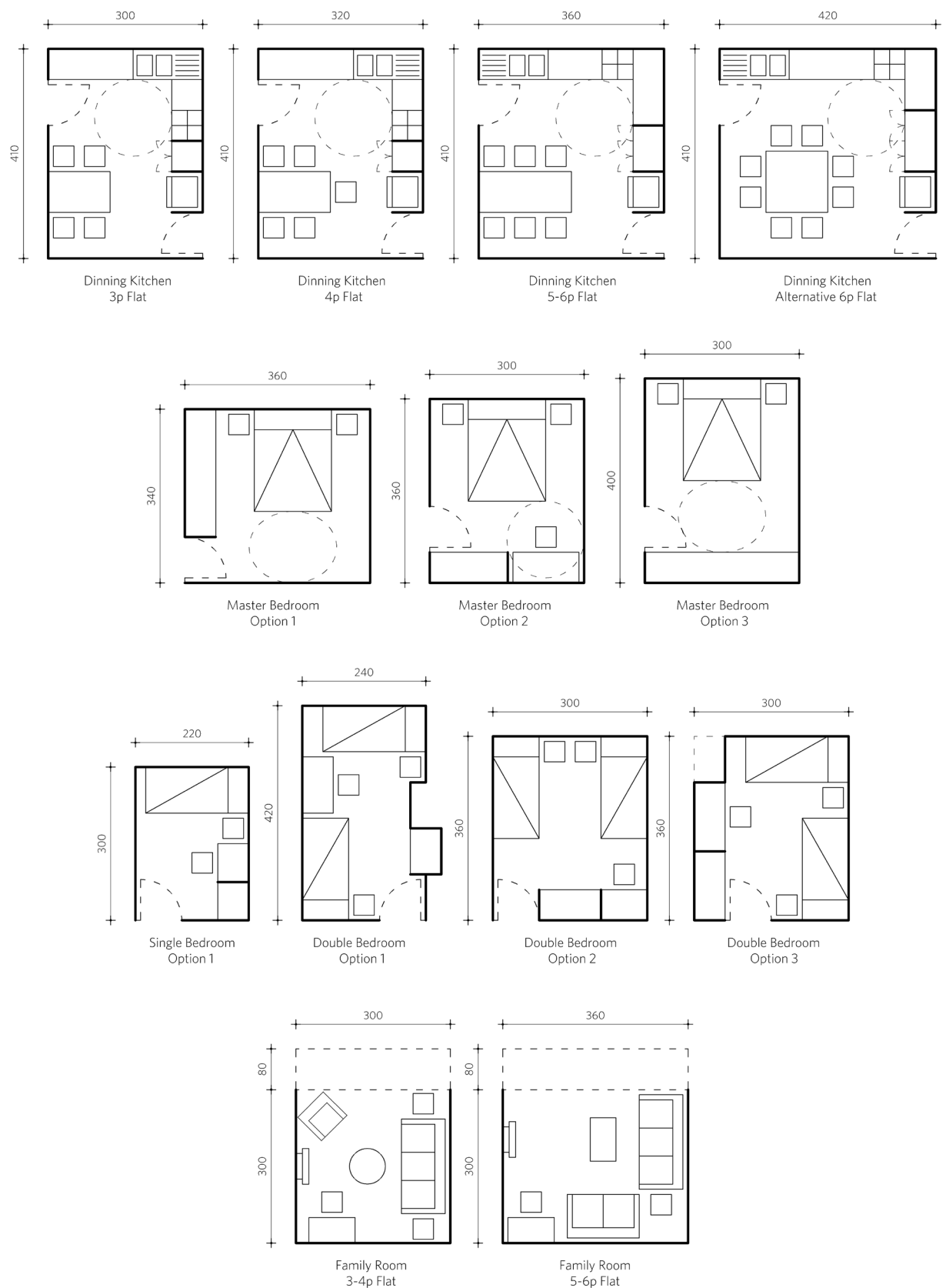


Figure 35
Proposed space standards for kitchen, master bedroom, bedrooms, and family room design.

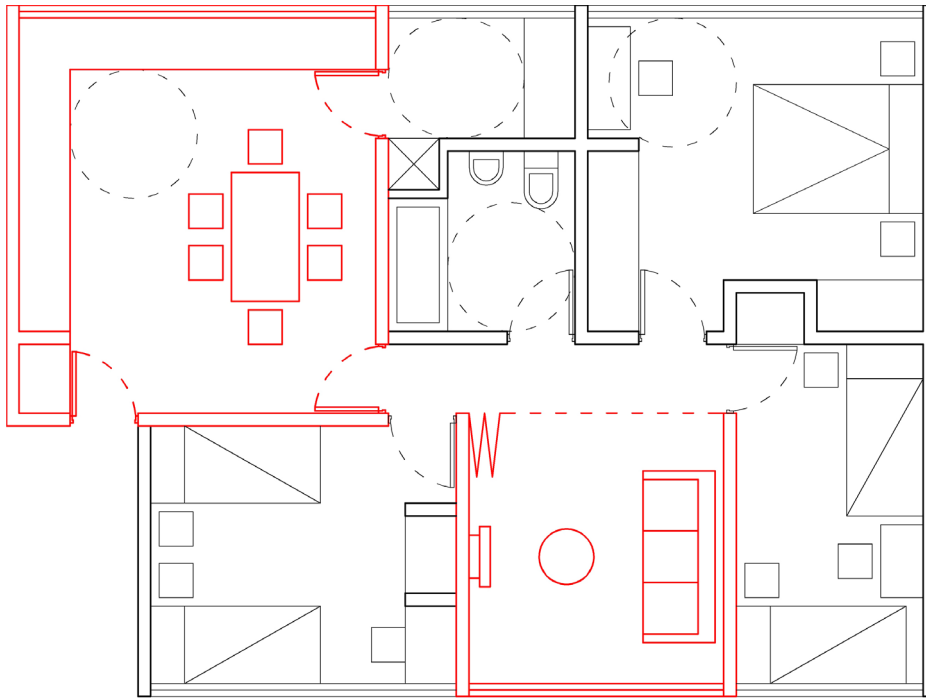


Fig. 36
Proposed non-conventional layout for a 3-bedroom dwelling in 75 m2.

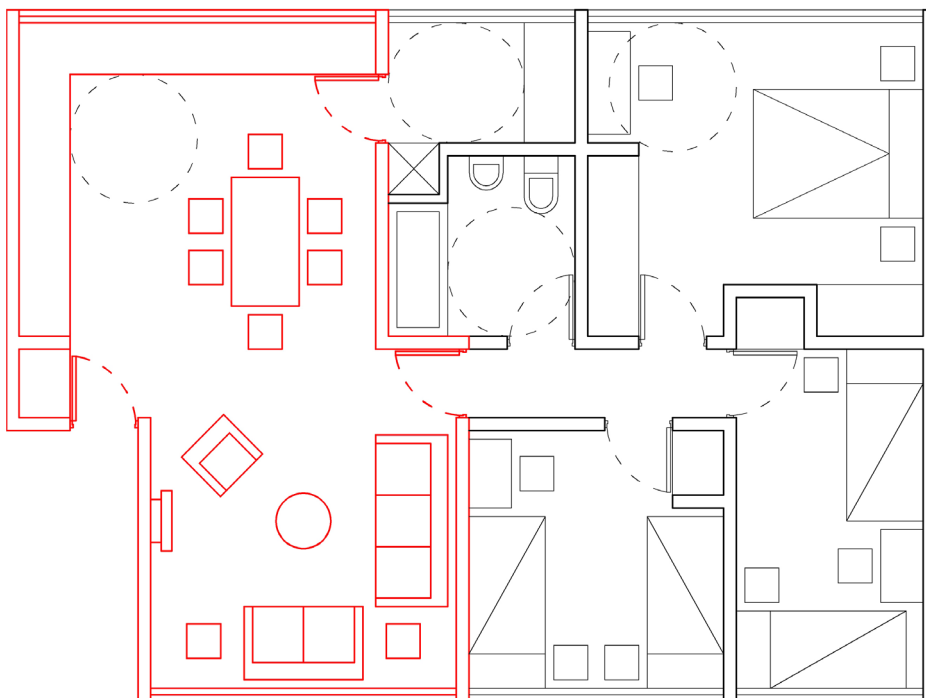


Fig. 37
Conventional layout for a 3-bedroom dwelling in 75 m2.

Elemental assumes that within a certain amount of square meters it is possible to respond to multiple spatial and functional demands typical for a mid-income household. However, the paradox of Elemental's proposal is that, in order to achieve a larger home, it is necessary to provide a smaller version of the already criticized minimum dwelling. By doing so, achieving an 'adequate' standard is determined by the ability of individuals to pay for the missing half of the house (Fig. 30). That means favouring those with financial means, disregarding the financial limitations typical for low-income groups. By only focusing on dwelling size, Elemental overlooks not only economic but also social and cultural differences between low and mid-income groups.

Even though the statement by Elemental seems to avoid explicit design prescriptions and responses to a range of domestic demands when referring to its design scheme, it becomes a highly rigid solution. In fact, it is a fixed dwelling programme that, similarly to the first versions of the housing design guide in the UK, provides a carefully detailed arrangement of rooms and functions. The proposed scheme suggests a house of 80m² for a family of five. These are accommodated in 3 bedrooms, 1 bathroom, living-dining space, kitchen, and laundry area (Fig. 31). To Alejandro Aravena, founder and director of Elemental, the dwelling programme and room sizes have the 'DNA of a middle class home'²². However, looking carefully at the demands typical for a mid-income family, these are different to those proposed by Elemental. In fact, the 'middle class house' is a simplified reading of what a mid-income house is, aspires to be, and represents, being no more than a rhetorical device (Fig. 32). According to socioeconomic studies (AIM), the 'middle class' is the broadest socio-economic strata found in Chile.²³ It is composed of the mid-low and mid-high income groups, which represent 45% of Santiago's population. Although the typical dwelling

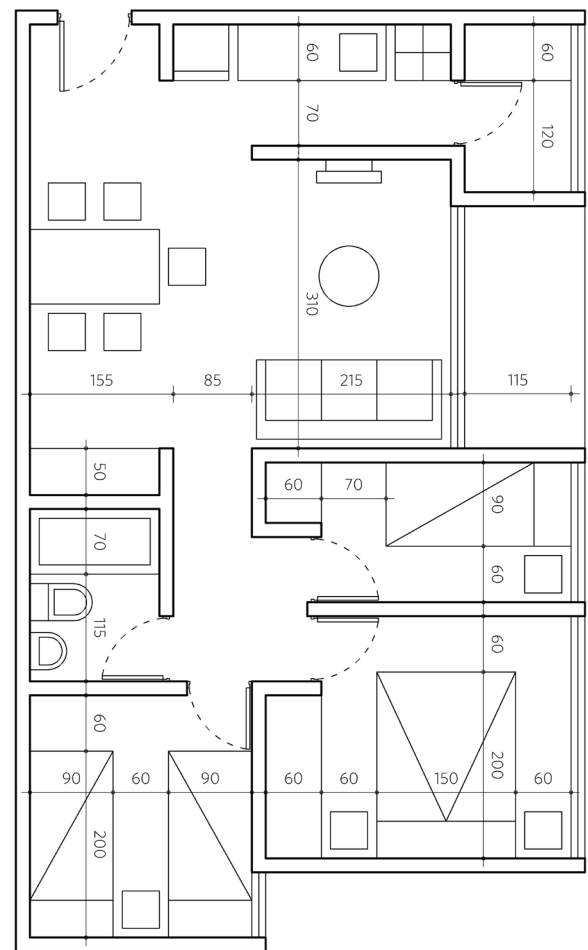


Fig. 38
Example of sub-standard mid-income housing (60 m²).

size and programme vary significantly, there are some shared design requirements that are fundamentally different from those proposed by Elemental – who focuses only on the size of the living-dining room, bathroom, and bedrooms. What is not considered is the dining-kitchen and the family-study room (Fig. 33). They concentrate, however, most domestic activities and represent the centre of daily life. On the one hand, the dining area has been replaced by a modest table in the kitchen, establishing a direct relationship with cooking, food storage, and kitchen appliances. On the other, the formality of the living room has been displaced by the flexibility of the family room, which is intended for guests or special occasions. The family room responds to multiple purposes such as studying, watching TV, playing, and working – placing high demand upon the one space. The problem is that the

22 Elemental Chile, *Documental Quinta Monroy* [Quinta Monroy Housing Documentary] <<http://www.elementalchile.cl/en/projects/quinta-monroy/>> [accessed 23 August 2016].

23 Asociación de Investigadores de Mercado (AIM), *Informe Grupos Socioeconómicos (GSE) 2012* [Socioeconomic Report 2012] <<http://www.aimchile.cl/wp-content/uploads/INFORME-SOCIOECONOMICO.pdf>> [accessed 15 March 2016].



Fig. 39
Design criteria for dwelling of different sizes (1 to 4 bedrooms) according to conventional and non-conventional arrangements.

size and arrangement of the dining-kitchen and family room are not reflecting their intensive use.

In spite of the mismatch between the use of spaces and dwelling programme, low-income groups are still favouring a conventional arrangement of the living-dining room as the central and bigger space of the house. In order to meet all housing requirements and remain affordable to mid-income groups – particularly to the mid-low ones – the dwelling programme has been subject to a process of shrinkage. That means the decreasing space standards and dwelling programme created a solution that is similar to the one proposed by Elemental. But this is precisely the confusion about the aspirations of a low-income house, misleadingly equated with a mid-income house. If the minimum dwelling needs to be rethought, this should question traditional arrangements. More specifically, it has to overcome the spatial redundancy of the living-dining room as a formal and underused area of the house. Instead, the dining kitchen and family room could be defined as two organizing centres that can answer to multiple household demands (Fig. 34). The former can be understood as a fixed programme and the latter as a flexible space. Apart from being a social and leisure space, the family room could become multi-purpose and also be transformed into a work space. This possibility is critical due to the limited access of low-income groups to work. Unlike mid-income groups that seek a university degree, people living in poverty can barely access secondary and vocational education, but having an available space at home can bring an economic base to the household.²⁴ This is, in fact, something very common in mid-size housing solutions with a front yard or back yard, which allows transforming this space into

a workshop or shop. Considering this, the minimum dwelling could become a device for social mobility and economic activity.

Although the described dwelling programme might be specific to low-income groups, the proposed space standards (Fig. 35) can also work for a more conventional dwelling arrangement (Fig. 36, 37). It can hereby ensure adequate room sizes and affordability even in completely private housing, which are currently not met by the real estate market (Fig. 38). This means that social housing standards can also become affordable, and private housing standards suitable for a wider range of demographic groups.

It is then clear that Elemental mistakes the problem of dwelling standards. However, it can be argued that by looking at the living patterns of the mid-income family, it is possible to bring new dwelling design considerations to the problem of the minimum provision. In contrast to the proposal by Elemental, the challenge should not be equating space standards, dwelling programme, and the image of a mid-income house, but to eliminate what is redundant in its configuration in order to bring back social and economic ambitions to housing while considering budgetary limitations.

To do that, one of the most important aspects to consider is the household structure. Contrary to most low-income dwellings that accommodate up to 6 people in small bedrooms, current studies point to a different composition and size of the family.²⁵ The insistence on designing dwellings for large families can be attributed to the historical problem of overcrowding. This was due to the cohabitation of multiple generations within the dwelling, housing grandparents, parents, children and even grandchildren together in some cases. However, the state's response to the housing deficit has led to a new low-income household structure. Low-income groups today average only 3.3 members per household, requiring only little more than half of what the minimum dwelling typically accommodates. The composition of the current

24 Low-income groups have a university education rate lower than 1%. Although the recently released policy of free university education for low and mid-income groups aims to change this number, one of the main difficulties of the lower socioeconomic strata is to get the needed grades (score) in order to be eligible for a place at university. Moreover, one of the main problems is not considering technical education as part of the scopes of the policy, which prevents low-income groups to have a more tangible choice for their educational development. This takes into account that completing a university degree requires a strong base of primary and secondary education. That is precisely one of the most critical points. First, due to the low quality of public school education in Chile. Second, because of the social risks to which people living in poverty are subjected to.

25 Asociación de Investigadores de Mercado (AIM), *Informe Grupos Socioeconómicos (GSE) 2012* [Socioeconomic Report 2012] <<http://www.aimchile.cl/wp-content/uploads/IN-FORME-SOCIOECONOMICO.pdf>> [accessed 15 March 2016].

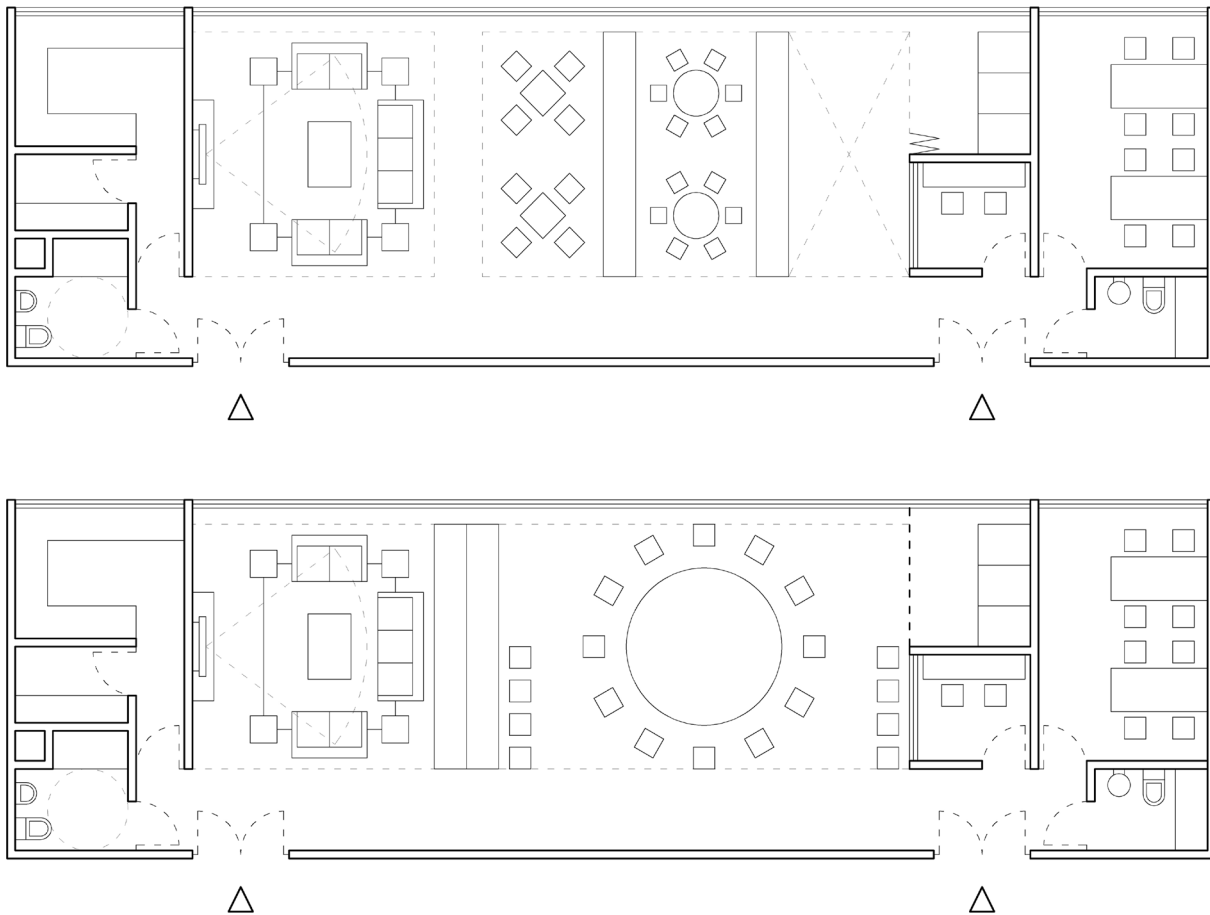


Figure 40
Example of a desirable shared space facility (two different layouts).

family therefore means a significant decrease in the number of children. Taking this into account, it can be argued that the dwelling programme is wrong. According to current data, what is typically required is a 2-bedroom dwelling. This means it is important to create dwellings of a size between 60 and 70m² – if the proposed space standards are applied – being smaller in overall size but at the same time much more spacious for the target families than the one proposed by Elemental.

In spite of the changes in the size and composition of the family, altering the dwelling programme under the existing regulatory framework is difficult. The main reason for the redundancy of space within dwellings is homeownership, which forces the state to always provide a large dwelling programme independent of size and structure of the household. However, if the minimum dwelling is provided within a letting sys-

tem, housing supply could adapt to the transformations of the household structure over time. For example, this might start with a young couple (1 bedroom house), then children (multi bedroom house), and finishes with an elderly couple after the children leave the home (1 bedroom house). Thus, housing design guides should include dwelling solutions that could answer to new multi-generational demands, ranging from small to large dwellings (Fig. 39).

Besides the problem of homeownership, another important issue that affects the household structure is the problem of job opportunities. Low-income groups have an employment rate of only 34% whereas mid-income groups have a rate of 50%. This is reflected also in larger family groups when the employment rate is higher, which creates a family of 4 people in the case of mid-income groups (0.7 more than

low-income groups)²⁶. One possible reason for the smaller size of the low-income family is its location in faraway areas deprived of infrastructure, urban facilities, public services, jobs, and social diversity. The lack of adequate living conditions limits the aspirations of families to take long-term economic responsibilities, such as the growth of the family. A typical problem associated with the lack of social welfare services is that parents prefer to stay at home, in order to take care of the raising of their children, which has in turn a direct impact on the economy of the household. Adding this problem to the difficulties in finding jobs, low-income groups have an average of 1.1 persons working per family. However, the staying of one of the parents at home is not a choice but a way to deal with the scarcity of both financial resources and opportunities for social and economic development.

A different case are low-income families with a higher employment rate – whether these are families with two working parents or single parent households – which forces them to organize the raising of children differently. Even though the state provides a system of nurseries and public schools, the school day ends at 5pm whereas the typical workday finishes around 7pm, creating a mismatch between the two. If commuting time is added to the workday (usually from 1.5 to 2 hours for low-income groups), parents arrive home around 9pm. This leaves 4 uncovered hours that are critical for the care of children.²⁷ The most common practice is asking for help from the closest social network, which is usually made up of relatives or neighbours.²⁸ But in this practice there is often no educational ambition. The main concern is to simply find a place where children can stay, regardless of both the attention they need – for example, the supervision they require to study and do their homework – and the risks of leaving them in the care of people with no commitment to parenting. In fact, many chil-

dren spend this time in the streets, starting often a vicious circle of marginalisation and violence.

Finding a mechanism to deal with the absence of parents should be seen as a central problem and therefore a new parameter within the housing design guide. That means creating a domestic environment where children are protected and educated. Although the absence of parents can be partly solved by expanding existing programmes of extracurricular activities in schools, the problem can be generally addressed by introducing nursing and childcare facilities at the scale of the building, urban block, or in parallel to the provision of educational infrastructure at the scale of the neighbourhood. Complementary to this, the dwelling programme for the elderly can also have an impact on the design of communal facilities. Due to the family room becoming redundant in both real use and my proposed housing, one of the suggested transformations is to strengthen the programme of shared areas, including spaces for old people, in order to interact with neighbours (Fig. 40).

26 Asociación de Investigadores de Mercado (AIM), *Informe Grupos Socioeconómicos (GSE) 2012* [Socioeconomic Report 2012] <<http://www.aimchile.cl/wp-content/uploads/IN-FORME-SOCIOECONOMICO.pdf>> [accessed 15 March 2016].

27 Some schools offer extracurricular activities once the school day finishes. However, these are mostly exceptional cases.

28 Usually the poorer the stronger are the social networks. These are set to deal with many of the problems emerging from the lack of resources and infrastructure.

CONCLUSION

Beyond Spatial and Functional Autonomy

Most of the discussion about dwelling design has focused on two issues. On the one hand, it is concerned with problems of efficiency. In line with this approach are minimal dwelling programmes that confine 'users' to performing a number of specific domestic tasks, functionalist-based design strategies for flexible dwelling, and sub-standard solutions that provide a fragment of a 'full size' house. On the other, the debate centres on the need for creating generous standards in order to respond to multiple activities and living patterns. The 'quality' of design is defined either by an overall dwelling size that asks for spatial redundancy and programmatic indeterminacy or by a highly prescriptive compendium of space standards that aim at responding to different family compositions. From these two approaches one can argue that, although including criteria based on spatial and functional efficiency should be a fundamental concern of dwelling design – being these reflected in the proposition of a non-conventional (smaller) dwelling programme, multi-function arrangements through the strategic arrangement of the family room, and rooms sizes capable of responding to different demands for space – the problem is that they account for nothing more than quantitative and physiological needs, which, according to Teige, respond only to one aspect of dwelling.

The other aspect relates to existential and socio-political concerns, thus requiring a different approach to the notion of dwelling. This means to overcome the idea of the dwelling unit as a self-sufficient space in which all kind of demands can be answered. Such an understanding of the problem is, firstly, related to the forced provision of homeownership. Through homeownership, it is expected that people will be able to meet all their needs throughout life in a fixed and small dwelling solution instead of supporting a letting system capable of responding in a focused manner to different household structures. That is to say, the housing provision system should deliver small-, medium- or large-sized dwellings depending on the

case, which would imply for a housing design guide to include a range of dwelling solutions instead of an ideal one. Secondly, notion of dwelling also relates to the need to perform socio-educative practices in the private sphere, which are undermined by the inherent limitations of people living in vulnerable conditions, the lack of space, and an inadequate dwelling programme. These problems call for not only a functional, but also a social 'decompression' of the minimum dwelling by proposing a complementary programme located outside of the individual unit. Through the provision of leisure and study areas the new space promotes socialization among neighbours in order to both build a network of social support, and create an environment of collective learning, ultimately decentralizing the socio-educative function of the family. This means therefore that a housing design guide should also include infrastructural concerns at the dwelling scale.

BUILDING AND BLOCK



The Block and the Urban

For Karel Teige, the decompression of the dwelling unit can be achieved by externalising a range of domestic functions. However, when he exemplifies the application of this apparently 'urban principle', the outcome is no more than the proliferation of generic and undetermined shared spaces at the scale of the building. This is clear when looking at the Dom-komuna housing by Barshch & Vladimirov (1929), which Teige uses to illustrate his ideas of collective living (Fig. 1, 2). The project is a large-scale building that puts together small sleeping cubicles with a wide range of collective programmes such as dining areas, club halls, study rooms, library, classrooms, lecture rooms, and sport facilities, among many others. Teige explains this housing project in the following way:

It is a self-contained community, an independent dwelling complex and a new urban type, designed as a unified architectural structure serving both individual and collective life. Its design and built form reflect the organization of collective life. It succeeds in fusing into a unified whole a whole series of heterogeneous elements.¹

The Dom-komuna housing aims at breaking with the modernist idea of the residential building as a 'beehive' that is made of an indiscriminate agglomeration of cells. The proposed building is conceived as a differentiated spatial and productive system where a number of private and public functions are thought of together, all of them being part of the domestic experience. In spite of this different design approach, what is not clear is the actual relationship between the building and the urban. Teige suggests that by including new programmes, an urban (social) lifestyle can be brought into the building. In doing so, he follows the logic of functionalist determinism, assuming that

by naming and assigning specific activities to shared spaces, collective life will emerge by itself and thus most of everyday needs can be answered. That is to say, Teige proposes that city functions can be displaced and recreated at the scale of the building. The problem, however, is that the residential building is understood as a large and isolated entity that is not intended to affect its immediate environment nor to respond to its contextual conditions.

This critique is clear when looking at the general layout of the Dom-komuna housing, whose cruciform slab block arrangement reinforces the idea of the building as an autonomous object that create two main problems. The first one has to do with the lack of design considerations in the definition of urban boundaries either as a plot or block arrangement, showing a clear disregard for the formation of interrelated larger scales. The second one relates with the misuse of open spaces as organizers and articulators of the 'heterogeneous elements' of the housing programme. This allows creating a continuity of intermediate instead of disjointed urban experiences in parallel to housing programmes. This problem, however, is addressed in a highly unbalanced manner in the Dom-komuna housing project. Most activities are linearly arranged throughout the building axes, leaving open spaces as leftover areas, which are limited to both accommodate outdoor activities – by tracing some sports zones in one of the plot's corners – and respond to the basic issues of natural day lighting and ventilation. This way, the proposed decompression of the dwelling unit is to a great extent limited to the building boundaries and its ability to create an artificial urban lifestyle within it. From this understanding of the problem, one can argue that Teige's proposed relationship between the dwelling unit and collective programmes should be interpreted differently and conceived as a gradual sequencing of scales and domestic functions, bringing private and public realms together, from the dwelling to the city.

¹ Karel Teige, *Minimum Dwelling: The Housing Crisis, Housing Reform* (Cambridge, MA: MIT Press, 2002), p. 359.

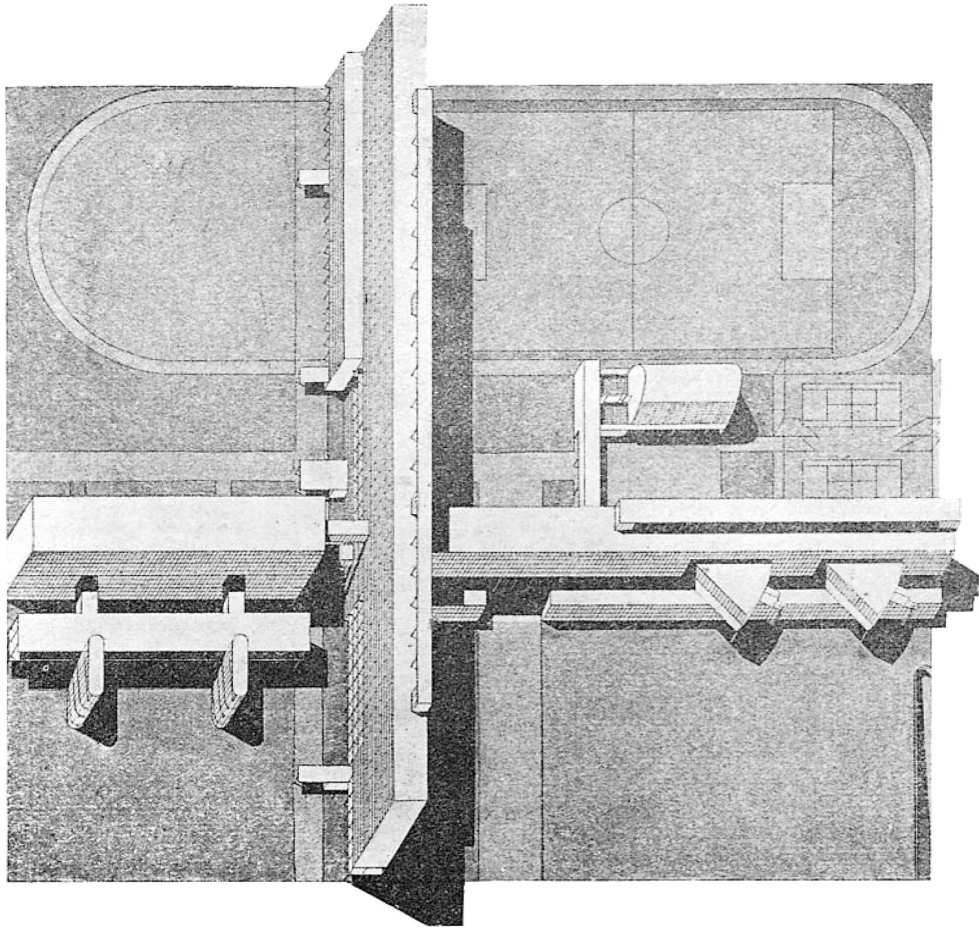


Fig. 1
General layout of the Dom-Komuna complex by Barshch & Vladimirov (1929). From Karel Teige, *The Minimum Dwelling* (1932).

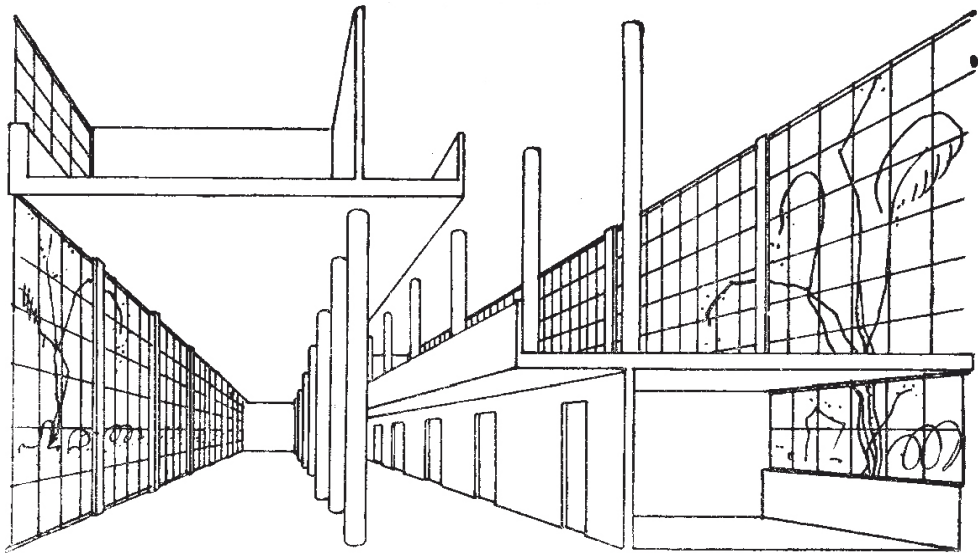


Fig. 2
Dom-Komuna's sleeping cubicles and hall of rest and recreation. From Karel Teige, *The Minimum Dwelling* (1932).

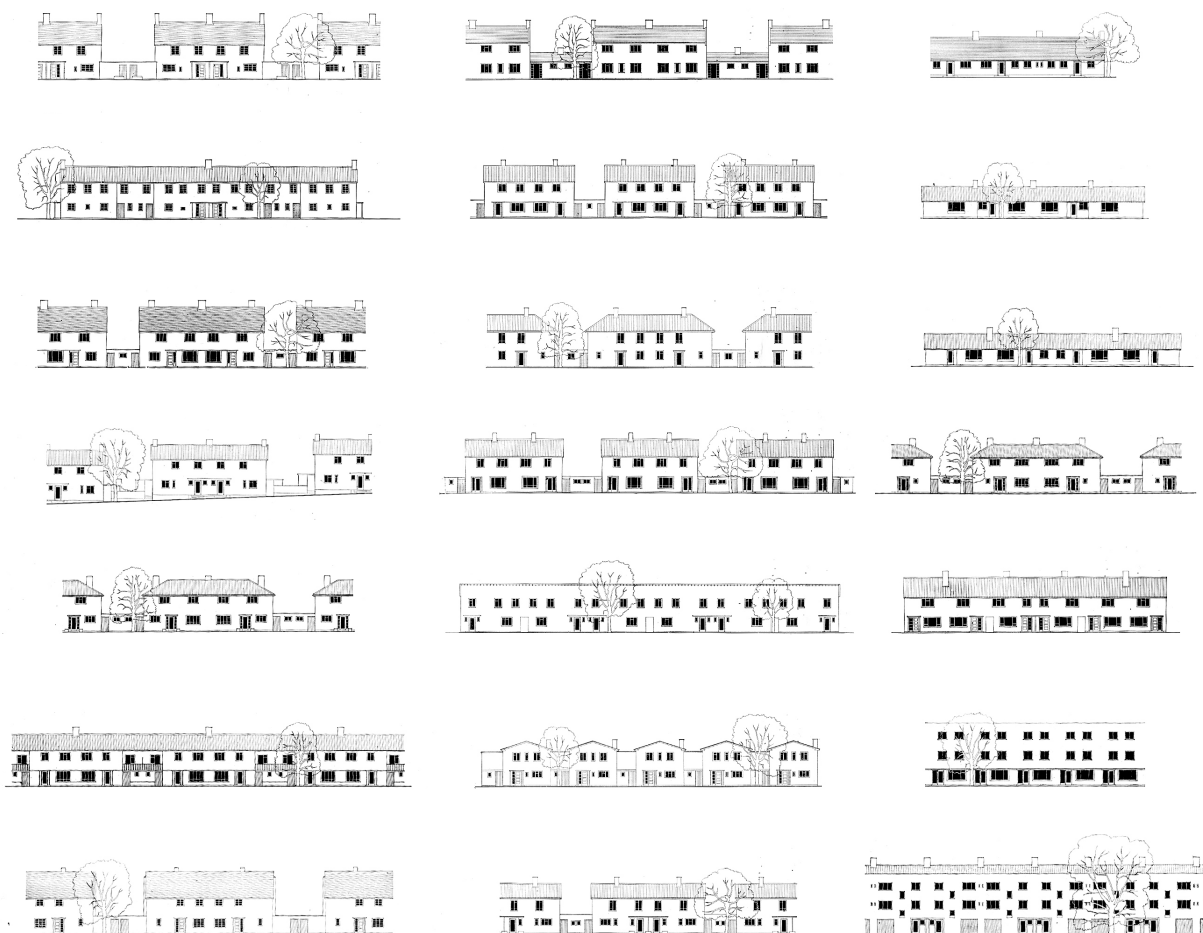


Fig. 3
Proposed ranges of terrace houses. From *Housing Manual 1949*.

The above can be addressed by acknowledging the ability of the block to create the transition between private domain and the urban. In fact, the block plays a fundamental role in providing a rationale for organizing these two different spheres of the domestic. It sets the internal arrangement of dwellings and buildings on the one hand, and installs a logic for its repetition at the large scale on the other. Because of this, apart from creating an architectural design framework for the compatibility of buildings within a single scale, its potential of proliferation makes it a fundamental component for urban design. With regard to this urban condition of the block, Leon Krier states the following:

The building block, 'insula', 'pate de maison' or 'îlot', 'Häuser-Block', must be identified as the most important typological element

in the composition of urban spaces, the key element of any urban pattern. [...] As a typologically fixed element it can generate urban space but it can also remain undefined and merely result from the order of an urban pattern (of streets and squares).²

As Krier states, the block is determined by its buildings' typological qualities. These can either emerge from the internal organization of the block and impact on the urban scale or be conditioned by its immediate environment. This way, the block is never understood as an isolated component but always stands in relation to a larger urban context. In

² Leon Krier, 'Urban Components', *Architectural Design*, 54 (1984), 43-49, (p. 44).

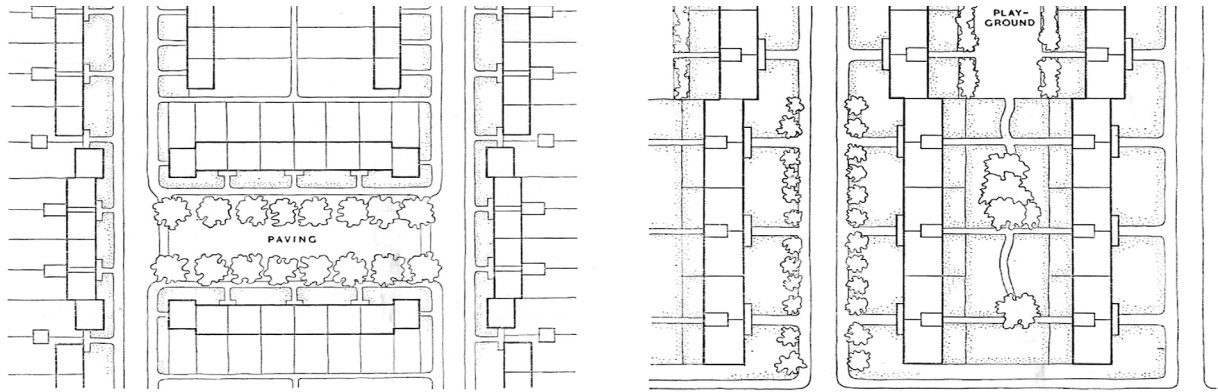


Fig. 4
Proposed design schemes for urban layouts, housing types and grouping. From *Housing Manual 1944*.

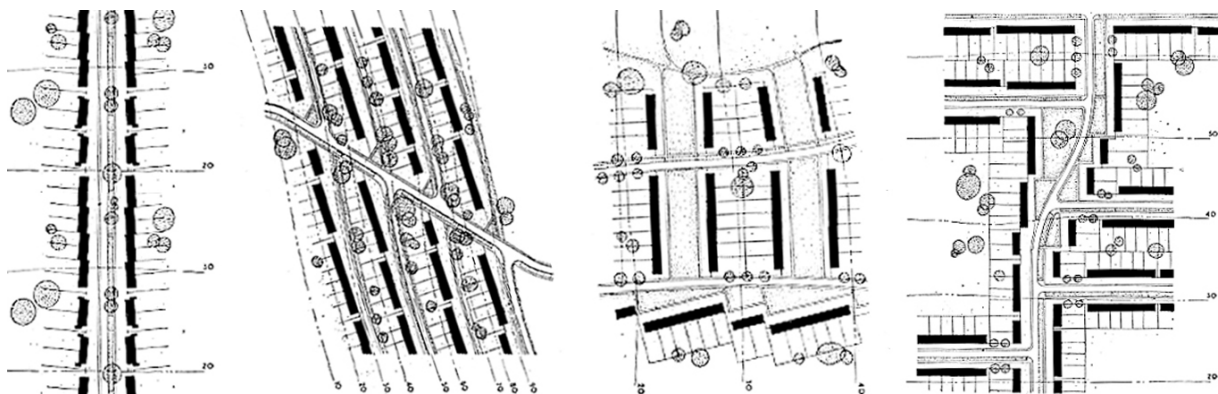


Fig. 5
Proposed housing arrangements in sloping and hilly sites. From *Housing Manual 1949*.

addition to this, defining the block from a typological point of view means that it is determined by systems of spatial organization that can relate housing to other uses and urban functions and respond to different needs of domestic life. Thus, the block is in principle an infrastructural component and therefore it has to be understood as an essential scale in urban design.

Bringing this discussion into the scope of the housing design guides makes it possible to observe that the main focus has been so far mostly on singular buildings, without considering the block scale as such. They have largely been concerned with housing types and density, whose outcome is an undifferentiated proliferation of the same building solution. Such attitude is explicit in the first housing design guides – particularly in the *Housing Manual 1944, 1949, 1955* – that provided a detailed range of terrace houses (low-

density) and slab blocks (mid-density) (Fig. 3). Once density is defined, it is expected that each housing type brings its own rationale to the organization of the urban space. The problem of the proposed urban arrangements, however, is that they only define the spatial relationship among buildings, which does not necessarily set a clear idea for their assembly at the block scale (Fig. 4, 5). In fact, most of the given examples are urban fragments that do not provide guidance for the block scale. Even in the few cases where the block is defined, this is no more than an agglomeration of housing and green areas deprived of a specific physical or social function. This shows a disregard for infrastructural provision. The examples rather focus on adapting the prescribed housing types to different plot sizes, thereby defining only a strategy for the proliferation of housing.

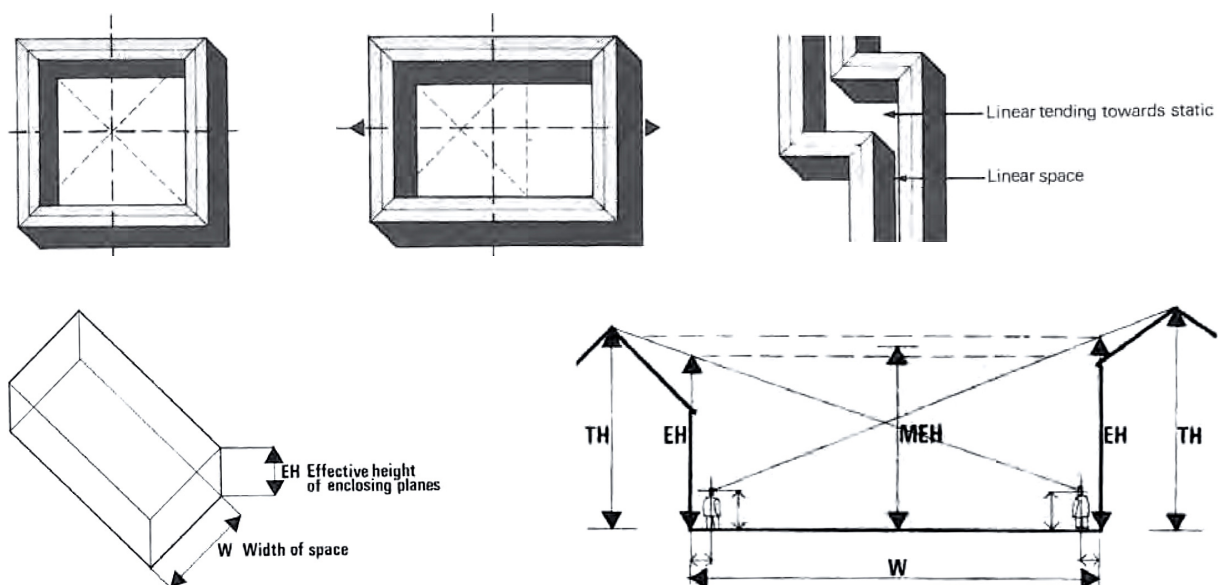


Fig. 6 - 7
Diagrams for measuring effective height. From A Design Guide for Residential Areas (1973).



Figure 8
Sketches of an incorrect and correct architectural composition of an urban interior. From A Design Guide for Residential Areas (1973).

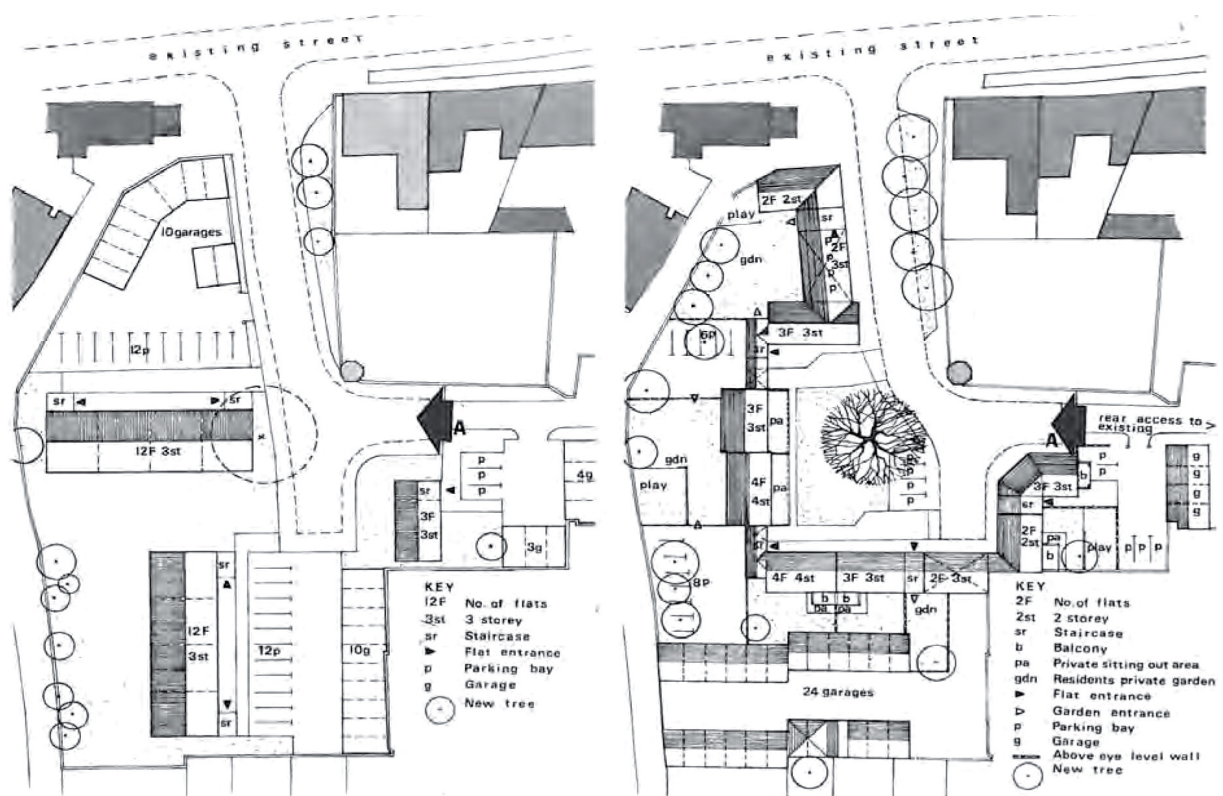


Figure 9
Unacceptable versus acceptable urban arrangement of medium density housing. From *A Design Guide for Residential Areas* (1973).

The relationship between building and block is more ambiguous in the case of *The Essex Design Guide* (1973), whose main concern is preserving the visual features of the traditional English village. To do that, the design guide regulates house sizes and the proportions of urban space (Fig. 6, 7). The latter has no other ambition than creating spatial variations between street and courtyard arrangements, for which the guide introduces criteria such as human scale, length of spaces, use of trees, systems of spatial enclosure, landscaping, and house entrances, among others (Fig. 8). All of them are based only on isolated physical aspects that do not create larger assemblies or urban components. In fact, most of the examples are block interiors without much information about their urban context (Fig. 9). This attitude of creating a highly generic and non-prescriptive document is even more apparent in the case of the *London Housing Design Guide* (2010). The reluctance to provide explicit design guidance beyond the dwelling unit translates into purely written recommendations dealing with issues of character and context, outdoor

and play spaces, overall density, residential mix, entrance approach, shared circulations, car parking, cycle storage, and waste and recycling facilities.

Leaving the UK context, one of the few design guides that considers the block scale is the *Good Solutions Guide to Mixed Use Developments in Town Centres* by the New South Wales Planning Department (New Zealand, 2005). Although this guide acknowledges the importance of the block in urban design, this is understood independently from the building scale, for which the *Good Solutions Guide to Apartments* exists. This sets the typical design criteria that any building should consider – even for buildings that are not necessarily intended for residential use – dealing with problems of sun access, building orientation, views, car parking, visual privacy, horizontal and vertical accesses, corridors, and accessibility, among others (Fig. 10). All of them are highly generic and do not refer to any housing type, building arrangement or context. Rather, they are a set of isolated design considerations that can be applied independently. In

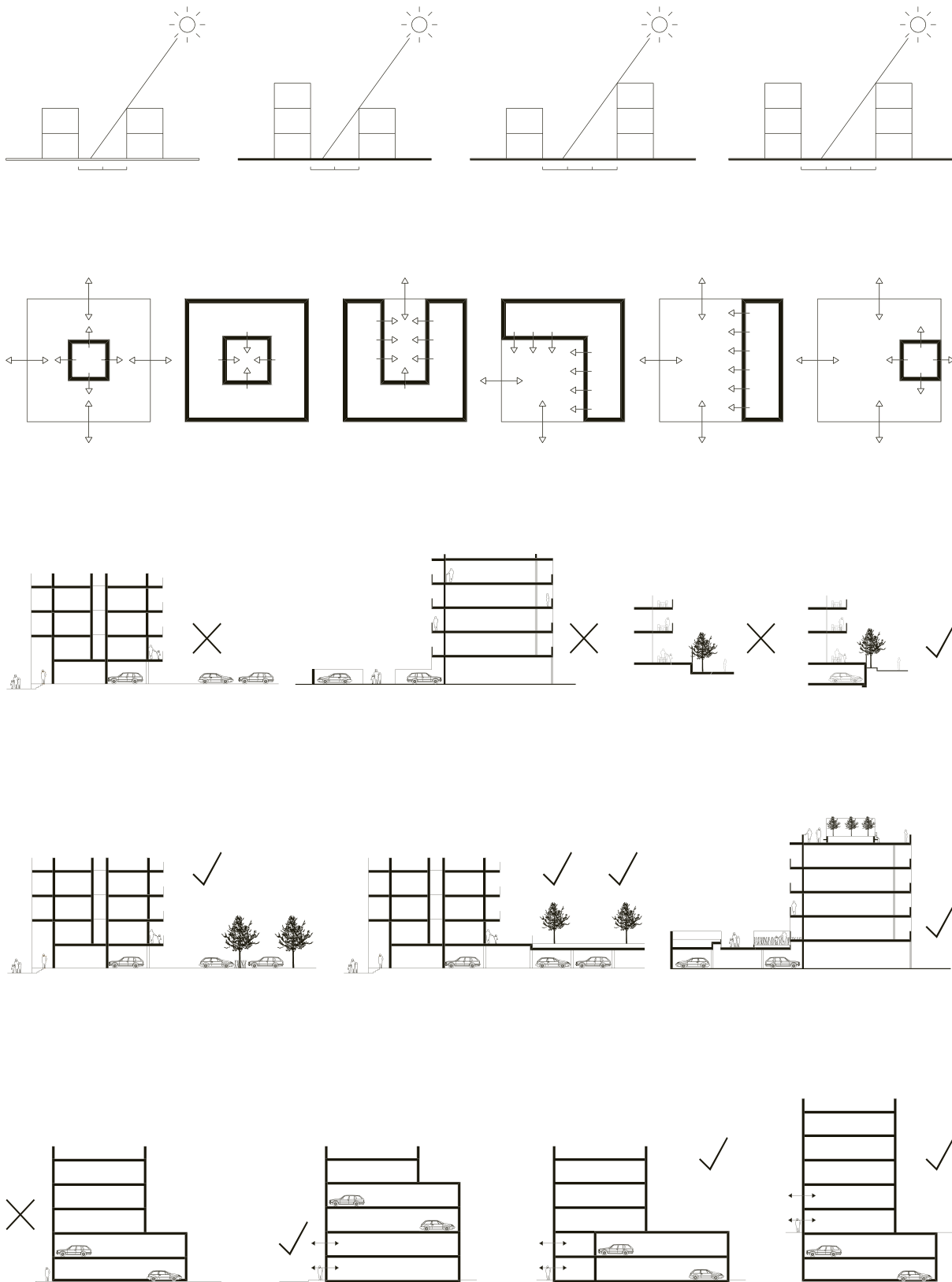


Fig. 9
Suggested good practices in building design. From Good Solutions Guide to Apartments (2005).



Fig. 11
Width requirements for accessible 'on plot' parking. From *Lifetime Homes Design Guide* (2011).

fact, most design criteria are determined by purely quantitative constraints, without referring to their compatibility in building and block arrangements, which is a qualitative problem. This attitude towards building design is the same as that of *Lifetime Homes* (2011), which mainly focuses on creating accessible housing standards such as parking areas, circulation gradients, car ports, accessible routes, and entrances (Fig. 11).

Unlike these two cases, the *Good Solutions Guide to Mixed Use Developments in Town Centres* has a less restrictive approach to design and its main concern is the multiple combination of housing with non-residential uses. In fact, the title of this guide implies housing in relation to urban centres, which is mainly achieved by incorporating infrastructure. The guide includes specific design criteria such as context, urban compatibility, horizontal and vertical arrangement of programmes, block boundaries, building form, block corners, and courtyard developments (Fig. 12). However, despite the guide's attempt at being specific to context, this remains vague when considering its applicability to different

plot sizes, programme mix, and arrangement of different building types. The possibilities of block development are in fact very limited, being in most cases a combination between mid-rise buildings and single courtyard arrangements. The problem here lies in the separation between building and block scale. This hinders exploring the potential of different building types to create specific block assemblies. In spite of that, what is particularly remarkable about the proposed relationship between housing and non-residential uses is that the block perimeter becomes an essential feature to incorporate infrastructure, either in vertical or horizontal arrangements. By means of the perimeter it is possible to define both external and internal functions, which can respond to different demands according to the privacy or publicness of the incorporated programmes.

Based on the above, it can be argued that a housing design guide should be much more explicit in defining the infrastructural outcomes of building and block design. These should be understood as two interrelated scales in spatial and functional terms that can combine activities of different natures and

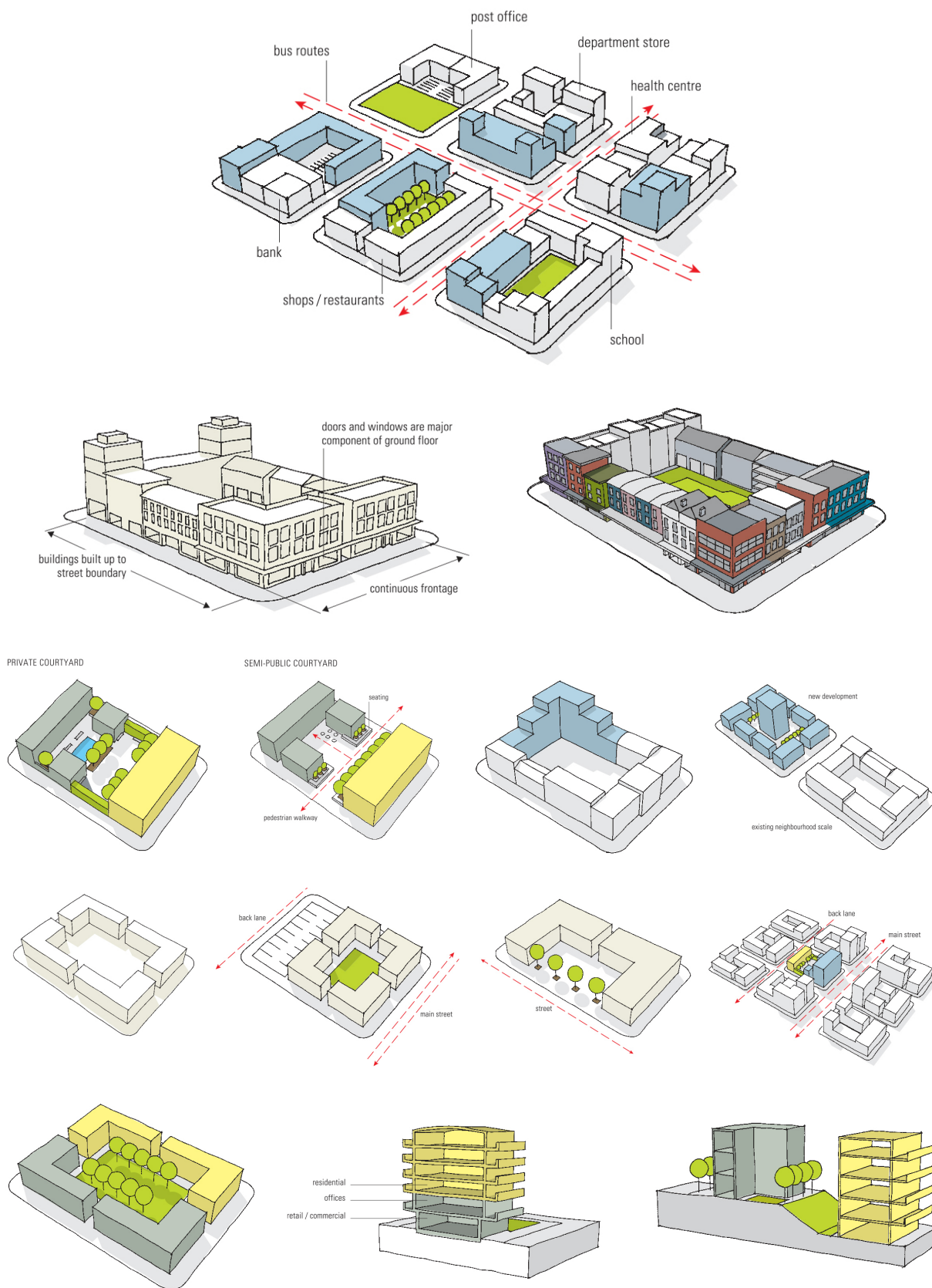


Fig. 12
Diagrams for mixed use arrangements. From Good Solutions Guide to Mixed Use Developments in Town Centres (2005).

produce multiple arrangements. In doing so, it is possible to not only bring closer the urban to the domestic scale but also set a rationale for the creation of infrastructural assemblies at larger scales, which ultimately make of the building and block a common framework for urban design.

Assembling Social and Design Differences

Creating a common world is not only a problem of putting together a number of physical elements belonging to different natures, such as housing and infrastructure. The challenge is also setting a framework in which diverse social manifestations can be deployed. Bruno Latour in *Reassembling the Social* (2005) unpacks this problem by reconsidering the main conditions of the social. To Latour, there is no such thing as a fixed element of the social – as social sciences historically claim. Rather, this is a phenomenon subject to a process of activation that must be seen in relation to its multiple actors. This way, the social can be understood through its underlying hybrid network of non-social elements. According to Latour:

Even though most social scientists would prefer to call 'social' a homogeneous thing, it is perfectly acceptable to designate by the same word a trail of associations between heterogeneous elements [...] it is possible to remain faithful to the original intuitions of the social sciences by redefining sociology not as the 'science of the social', but as the tracing of associations. In this meaning of the adjective, social does not designate a thing among other things, like a black sheep among other white sheep, but a type of connection between things that are not themselves social.³

The social is a dynamic concept that always takes on new forms of expression, which, in turn, trigger a constant process of re-associating its constitutive elements – whether concrete or abstract. Unlike

Teige, who establishes a fixed relationship between social functions and spatial arrangements, Latour argues that social assemblies are subject to change and therefore do not respond to previously imposed orders. Following this idea, if the social is the outcome of a set of assembled things that are not social, it is possible to argue that what a housing design guide should do is create a system for the association of different design elements, ultimately enabling a range of physical and social assemblies. That is to say, instead of prescribing final and ideal arrangements – and so adopting a determinist approach to design – its main task is to introduce design commonalities for the articulation and coexistence of its heterogeneous design elements.

Although each element has its own functions, it is necessary to establish a general mechanism for their joint action, which should be understood as a fundamental concern of housing design guides. The role of the design element is discussed by Alan Colquhoun in the essay 'Composition versus the Project' (1986). Colquhoun argues that although elements are fixed and finite – thus differing with Latour – they can produce an infinite number of arrangements. In fact, what design elements should do is to establish kinds of relationships, so their assembly becomes a compositional problem. Thus, function cannot determine the final configuration of a design solution. Rather, it has to be embedded in a design system capable of providing a rationale for compositional play. Instead of creating a formula, what design elements bring with them are degrees of freedom. Therefore, it is possible to argue that instead of defining large-scale arrangements, housing design guides should focus on setting both the design compatibility of its compositional elements (building types) and strategies for their assembly in the urban space (block).

One of the first examples dealing with the described problems is Sebastiano Serlio's sixth book *Of Habitations Suitable for all Grades of Men* (1537).⁴ Serlio understood housing design as an instrument

3 Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005), p. 5.

4 *Of Habitations Suitable for all Grades of Men* was never published and is only known in manuscript form.

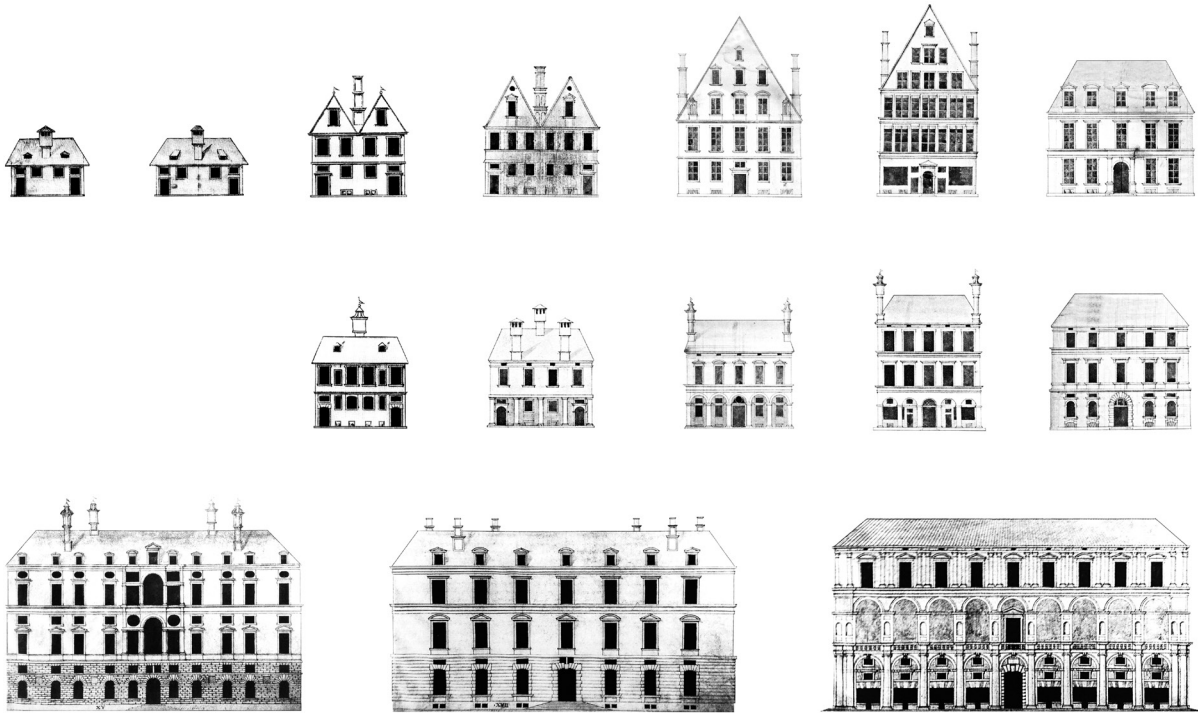


Figure 13
Ranges of housing solutions, from hovel to palaces. From *On Domestic Architecture*, Vol. 2 (1978).

through which all social spectra could be recognized as such, proposing a rudimentary version of what is now a housing design guide. In this design document, he proposes a wide range of housing solutions, including one for peasants and kings. The originality of Serlio lies in conferring the poor a clear role in the organization of the city and therefore in structuring society as a complex whole. Serlio addressed this problem by creating an extensive catalogue of houses – ranging from basic to complex solutions – sharing a set of common attributes that could be modified in their appearance but not in their structure (Fig. 13). This is achieved by introducing the idea of choice (*decorum*), which led Serlio to break with the predominance of classical orders and introduce a new architectural syntax (Fig. 14).⁵ The buildings are arranged in an abstract grid – a street-based system

– that accommodates all building types and social classes, essentially consisting of row houses, palaces and public buildings.

By focusing on the scale of the building, Serlio inverts the conventional approach to urban design from the city to the building. This means that the scale of architecture, based on a system of design complementarities, has the ability to determine the way in which the city is planned. However, the variety and complexity of the resulting urban arrangements – produced by the combination of the prescribed building types – is very limited. The urban outcome is always the same, being an undifferentiated proliferation of linear arrangements that do not produce intermediate scales or other functions between the street configuration and the city (Fig. 15). The reason for this is that all attention is focused on compositional and technical issues of building design, without considering the block or other interrelated urban scales. In fact, the design examples only refer to building interiors and facades through highly detailed housing solutions consisting

⁵ The possibility of choice only applied to the middle strata. The main reason for this is that the simplest houses had to respond to economic criteria, which precludes the application of classical orders. On the other hand, the highest strata could not hide its social status, resulting in the application of classical orders in all cases.

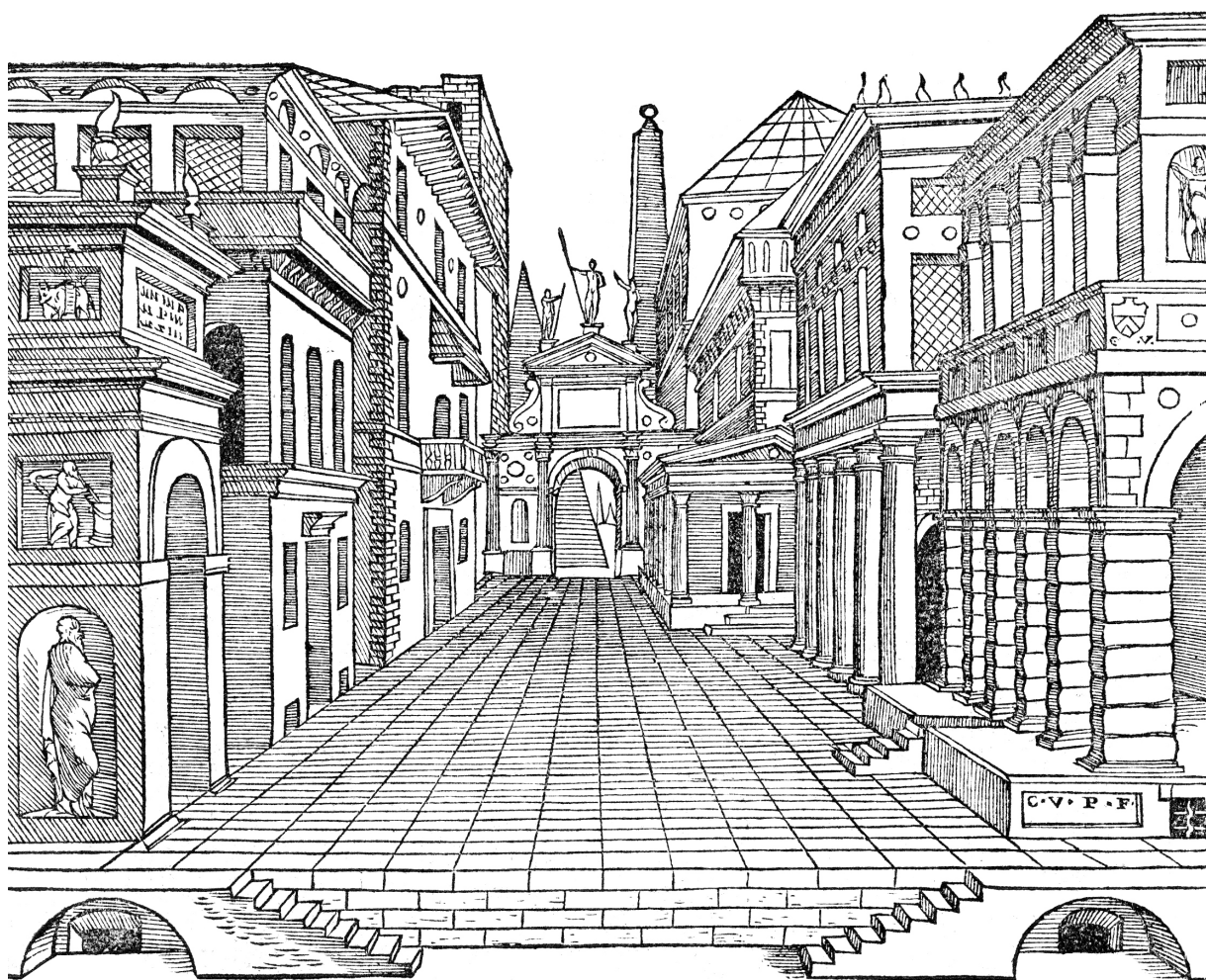
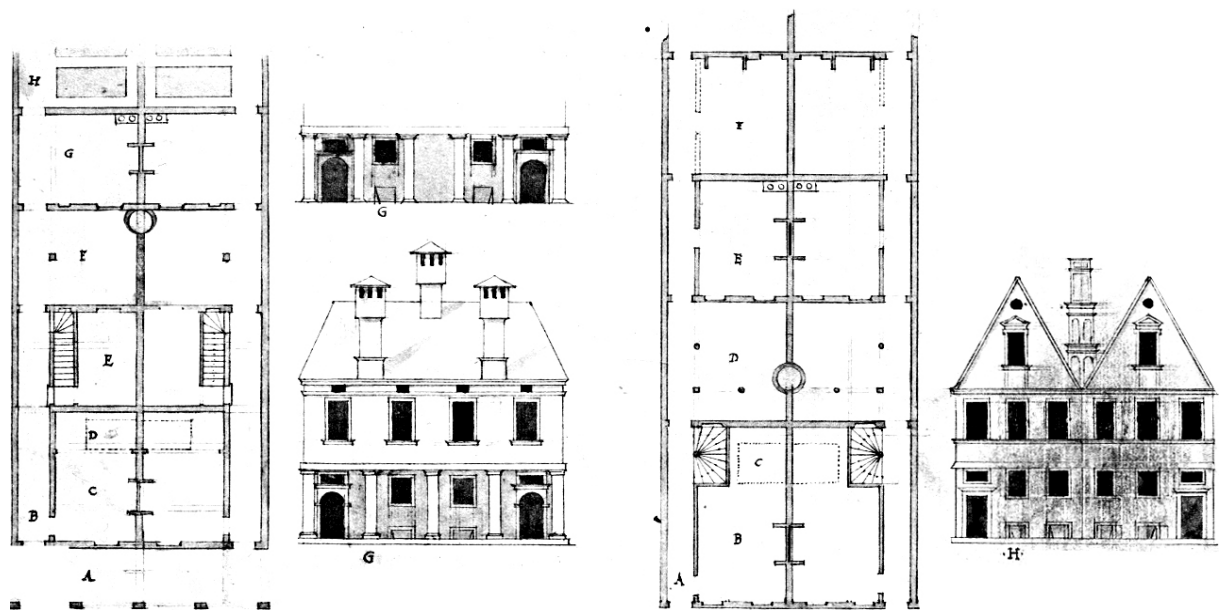


Fig. 14 - 15
 Above: Application of the idea of decorum. Two structurally similar housing solutions with different styles. Below: Scena Tragica. Application of a range of housing solutions in linear arrangements. From Libro Primo D'Architettura di Sebastiano Serlio Bolognese (1560).

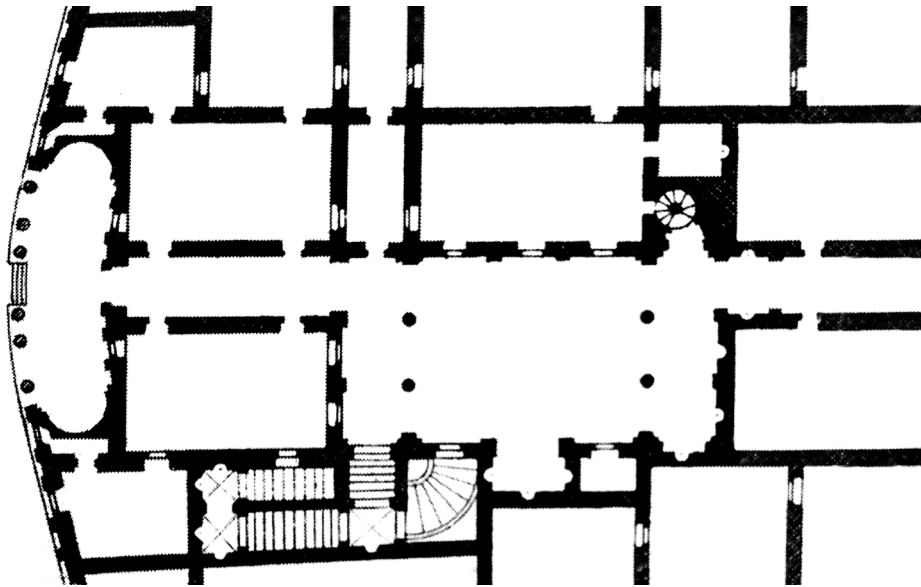


Fig. 16
Massimo alle Colonne Palace ground floor plan by Baldassare Peruzzi (1536). From Composition, Non-Composition (2012).

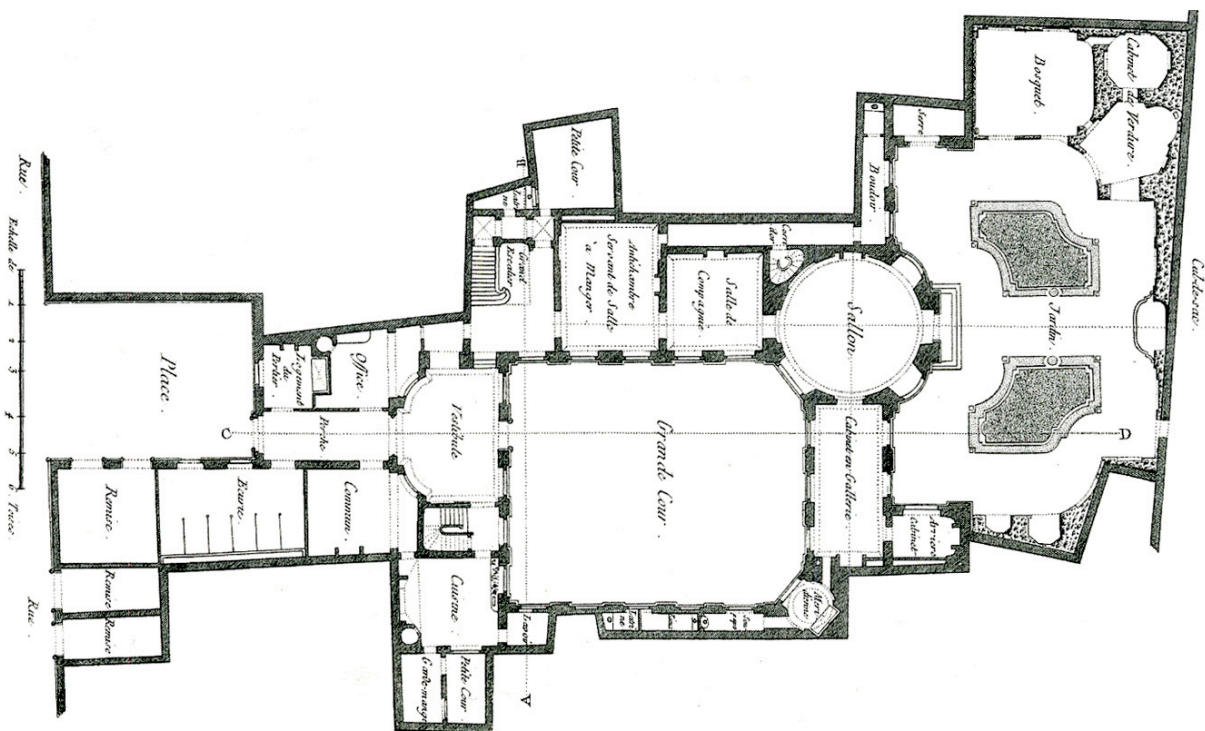


Fig. 17
Example of the application of the concept of distribution: Maison de Mr. le Marquis de Villefranche a Avignon ground floor plan by François Franque (1762). From Composition, Non-Composition (2012).

of floor plans, elevations, and written descriptions. In spite of the few urban considerations, Serlio aims to achieve a morphological cohesion through a single design framework capable of accepting social and formal differences, which should be understood as a central concern of housing design guides.

The Urban Block as a Condenser of Architectural and Social Scales

Unlike Serlio, who understood building design as a means to define the general organization of both the city and society, Jacques Lucan in *Composition, Non-Composition* (2012) provides a more inter-scalar approach to the problem of housing and urban design. This is based on the concept of distribution. The initial use of distribution in France during eighteenth century had however nothing to do with urban problems. It originally referred to the organization of internal functions in private buildings – and to providing comfort to the wealthier classes – which was achieved through the art of symmetry and the axial (enfilade) arrangement of rooms. The need of arranging rooms in a precise order meant providing a specific typological classification for each one, naming them according to functions as vestibules, galleries, antechambers, etc. Through the art of distribution, it was possible to link individual functions within a larger system of rooms. This way, rooms were not conceived as isolated elements, but always in relation to adjoining ones and so created a functional continuity.

The idea of distribution as an abstract and interior-based design framework was challenged by Charles Percier and Pierre-Françoise-Léonard Fontaine through the book *Palais, maisons et autres édifices modernes dessinés à Rome, Paris* (1798). By studying private houses built in Rome during Renaissance, and particularly the buildings of Baldassare Peruzzi, they realized that the principles of distribution could be translated into broader contexts and consider its application on irregular sites (Fig. 16). The challenge was to transform adverse site conditions into a geometrically equilibrated distribution of rooms. That meant acknowledging the impossibility of achieving

entirely regular arrangements. The art of balancing rooms gradually incorporated new spaces and started to include exteriors (Fig. 17). In other words, the concept of distribution was also applied to adjacent buildings and urban spaces. In doing so, the task of distribution became one of providing functional continuity between the building and the urban.

To Lucan, the design principles of distribution could be applied in such a way that streets could perform the function of corridors, squares that of chambers, and courtyards that of salons, etc. The implications of this change of scale from the building to the urban led in the 19th century to a rethinking of the concept of distribution as a problem of public interest, making architecture available to everyone. Consequently, the art of distribution was not exclusive to the bourgeoisie but equally had to consider all social classes, including people living in the most modest forms of housing. However, the problem is that distribution itself is not a means to democracy but in fact a mechanism of social differentiation and segregation, which is the opposite of what is proposed by Serlio: an inclusive and versatile common design framework. In addition to this problem, the concept of distribution only refers to a functional continuity of loose spaces, failing therefore to create urban complementarities. The main reason for this is that the block is omitted as a design element with the ability to create continuity from architectural to urban space.

Addressing this problem, Katharina Borsi in *Drawing and Dispute: The Strategies of the Berlin Block* (2009) discusses the potential of the block to provide not only a functional but also a socio-political order to urban design. This is by describing the development of the Berlin block between the 1860s and the 1910s, a period in which it underwent a series of transformations that turned it into an autonomous entity. The Berlin block is a courtyard-based and dense urban solution that makes use of its interior in order to introduce housing within a larger system of infrastructural provision. According to Borsi, 'the spatial organization of the block draws its interior and exterior spaces closely together such that programmatic activity can evolve fluidly from the street into the courtyards. This supports a flexible gradation from public to private space, while also promoting a distinct neighbourhood

identity.⁶ The Berlin block emerged in response to the urban extension plan by James Hobrecht in 1862, and Borsi argues that the block and the urban cannot be understood as separate issues, but as interrelated scales that turn the city into an infrastructural network, allowing living and working at the same time (Fig. 18). As she states:

The urban plan, as delineated by Hobrecht, posed questions about the distribution and linkage of populations and goods across the city. The plan allowed the various flows of pedestrians, goods, vehicles, air, water and sewage to be accommodated, and relationships between the city's different typologies to be established. In the 1860s, this primarily meant allowing for mobility and exchange across a single block and relating the blocks to one another; it also entailed relating the typology of the block to other urban typologies such as schools, hospitals, prisons, police and fire stations. Here we begin to see that the questions posed at the level of the single building and those posed at the larger scale of the city conditioned each other.⁷

Connecting the scale of the dwelling with the scale of the city had both physical and social effects. The block, through its courtyard configuration, inserted a new scale: a social space that became an expansion of the family home. This was not a neutral space but a confluence point where negotiations and studies coming from different disciplines took place – such as those related to problems of policing, health and hygiene. Due to this, the block gradually developed from an undifferentiated and labyrinthine system of corridors and voids (Fig. 19) to a model based on the agglomeration of clearly delimited courtyards (Fig. 20). Through this typological transformation, the block became an 'envelope' that operates twofold: it is inserted within a logic of the urban form and also

creates an internal space that responds to a number of domestic and social uses. This process went hand in hand with the emergence of the modern family. That meant creating larger and differentiated dwelling units – previously consisting of single room dwellings. In doing so, the family became an autonomous and self-contained unit that, as Donzelot suggests, requires spaces of observation and social control.⁸ Hence, the Berlin block allowed for an expansion of the space of the family and therefore of the domestic domain. Borsi argues that this expansion is given by a hierarchical arrangement of spaces. This creates a continuum of functions consisting of the street, block access, green spaces and corridor, playing central space, and building's interior (Fig. 21). To Borsi, all these transitional functions ultimately create a civic space that recognizes dwellers as members of the same political community.

One of the most powerful arguments of the spatial differentiation of the Berlin block is that once the inner and outer block boundaries are demarcated, they require a network of compatible lines and therefore another scale, which is the scale of the neighbourhood. However, even though this sets a clear relationship between the block and the formation of larger urban arrangements, it is possible to argue that this interdependence is highly determined by the existence of a master plan that sets the guidelines for infrastructural provision – as Hobrecht's plan does. This is precisely the point where the urban becomes problematic to housing design guides. How can the block be understood without the need for a detailed urban plan? A possible answer to this question is that the block's task should not only be about reconciling exterior and interior spaces (public and private) but also accommodating uses related to housing, such as commercial areas, offices and working spaces, sport facilities, nursery and educational facilities, and communal centres, among others. That is to say, to incorporate and make possible infrastructural provision at the block scale.

The Berlin block was superseded in the 1920s by

6 Katharina Borsi, 'Drawing and Dispute: The Strategies of the Berlin Block', in *Intimate Metropolis: Urban Subjects in the Modern City*, ed. by Vitoria di Palma, Diana Periton, Marina Lathouri (New York: Routledge, 2009), pp. 132-152 (p. 132).

7 Borsi, p. 142.

8 Jacques Donzelot, *The Policing of Families* (London: Hutchinson, 1980).



Figure 18
Berlin urban extension plan by James Hobrecht. From *Drawing and Dispute: The Strategies of the Berlin Block* (2009).



Fig. 19 - 20
Left: Corridor and void arrangements in the 1860s. Right: Differentiated void arrangements in the Bavarian Quarter (1909). From *Drawing and Dispute* (2009).

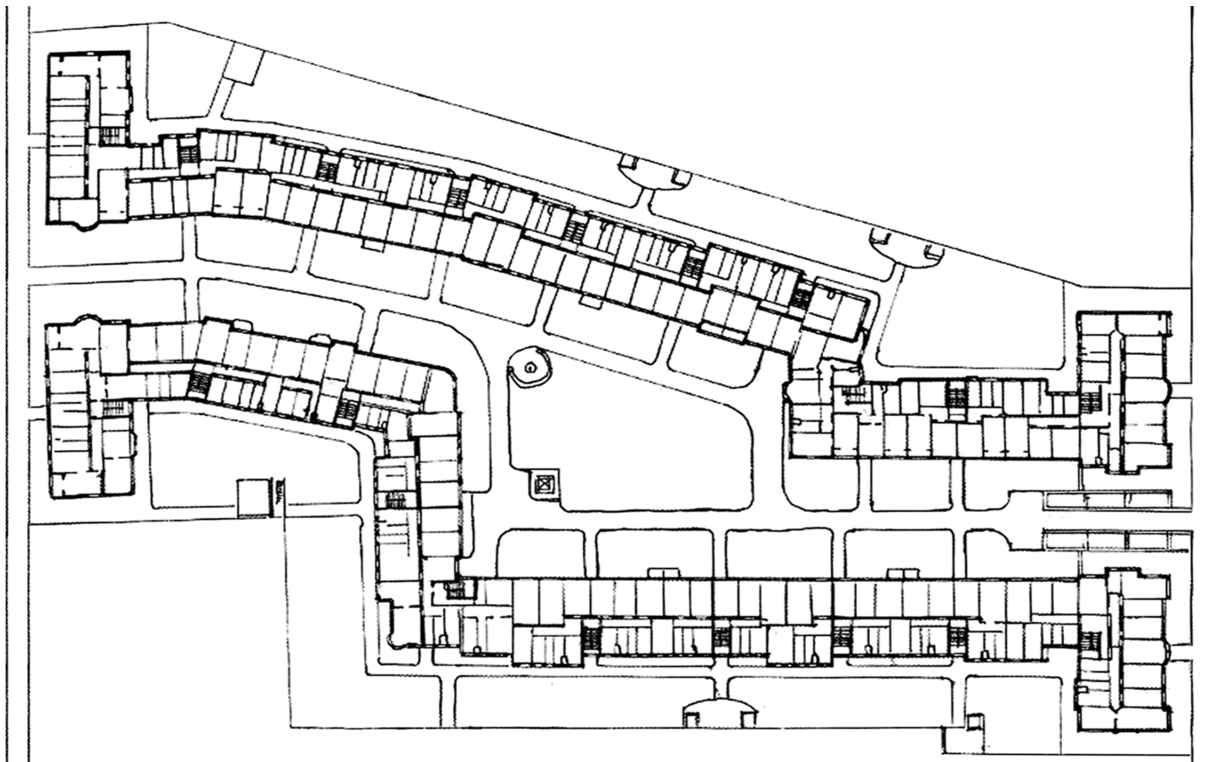


Fig. 21
Wohnstrasse housing plan by Paul Mebes (1907). From Drawing and Dispute (2009).

the modernist *Siedlungen* housing model. It was a continuation of the process of spatial and social differentiation of the Berlin Block. Colquhoun in 'Twentieth-Century Concepts of Urban Space' (1994) describes the *Siedlungen* as an urban solution that instead of adopting the typical modernist approach to urban design – based on free standing blocks disposed according to angles of light – proposes a combination between block perimeter and a flexible disposition of slab blocks in the interior. This allows for multiple spatial configurations of street and courtyard arrangements. To Colquhoun, this strategy provides 'variety of design, composition of solid and void, and a highly sensitive use of materials and colour to mitigate the effect of regularity, monotony, and abstraction'.⁹

What is paradoxical about this block solution is that

although it allows for a more versatile agreement between type and block form, the resulting spatial complexity does not follow infrastructural or programmatic needs. As is evident in the Britz *Siedlungen* (1925) by Bruno Taut (Fig. 22), the block arrangement is the outcome of the proliferation of the same building type (slab block). In doing so, the design scheme misses the opportunity to bring infrastructure into the block, which could have been achieved by including other building types in its flexible interior. Thus it is possible to argue that the 'block interior as infrastructure' should be a criteria to include in housing design guides. This would expand the existing criteria for housing and infrastructure, such as the ones proposed by the *Good Solutions Guide to Mixed Use Developments in Town Centres*, which only defines design parameters for 'block boundaries'. In addition to this problem, the *Siedlungen's* overall block configuration requires very large plots – much larger than the Berlin block's typical size. This situates the *Siedlungen* closer to a masterplan model that is made of nothing more than housing. Thus, if the dual relationship between enclosed order and flexible

9 Alan Colquhoun, 'Twentieth-Century Concepts of Urban Space', in *Modernity and Classical Tradition: Architectural Essays 1980 - 1987* (Cambridge, MA and London: MIT Press, 1994) pp. 223-233 (p. 226).

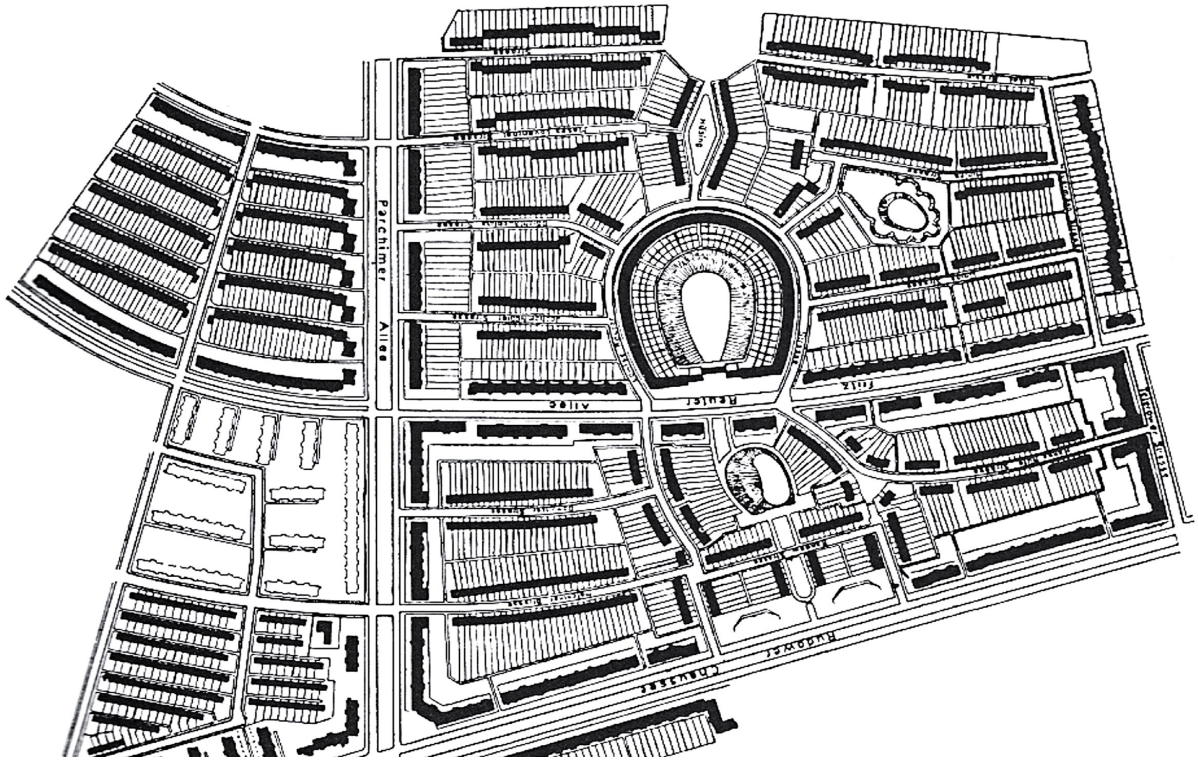


Figure 22
Britz Siedlungen general layout by Bruno Taut (1925).

interior wants to be included in the housing design guide, this has to be in relation to an existing fabric and typical block sizes.

The Autonomous Block and the Problem of Variation

An example for a clear relationship between building and block on the one hand and housing and infrastructure on the other is Ludwig Hilberseimer's Hochhausstadt (High-Rise City Project) of 1924 (Fig. 23). As he explains in *Metropolisarchitektur* (1927), the large city is mainly determined by the architectural qualities of its elementary units. Specifically, by the block and its logic of internal organization. Thus, the city is not seen by Hilberseimer as the outcome of a large-scale design scheme, but to the contrary, as the proliferation of its basic architectural assemblies:

The architecture of the large city depends essentially on the solution given to two factors: the elementary cell and the urban

organism as a whole. The single room as the constituent element of the habitation, and since the habitations in turn form blocks, the room will become a factor of urban configuration, which is architecture's true goal. Reciprocally, the planimetric structure of the city will have a substantial influence on the design of the habitation and the room.¹⁰

Hilberseimer defines the relationship between the cell and the city as a dialectical process in which one modifies the nature of the other and vice versa. This process is understood through the precepts of standardization, repetition, and mass production, making the city into an intelligible structure devoid of architectural exceptions. Based on these ideas, the role of the architect in the city is not anymore shaping single buildings but creating the conditions needed to

¹⁰ Ludwig Hilberseimer, in Manfredo Tafuri, *Architecture and Utopia: Design and Capitalist Development*, trans. by Barbara Luigia La Penta (Cambridge Massachusetts: MIT Press, 1976), p. 104.



Figure 23
Perspective of the Hochhausstadt by Ludwig Hilberseimer (1924). From *Metropolisarchitektur* (1927).

transform the city into a unitary urban system that brings together housing and infrastructure.

The above design concerns are all present in the Hochhausstadt. The project proposes to mix housing with offices, commercial areas, and other activities related to production. Instead of arranging them according to horizontal zoning, Hilberseimer overlaps the different programmes through a typological hybrid that combines a courtyard-based plinth with an array of parallel slab blocks. The key role of the cell in shaping the urban is clear looking at Hilberseimer's representational strategy (Fig. 24). Through a combination of plans and sections, he carefully draws the relationship between different scales, from the internal organization of the building, to the block, and finally the urban. Each scale is directly related to the next one, which allows an

understanding of both the proposed architectural assemblies and the block's potential to proliferate. This multi-scalar approach to building and block design has not been considered by housing design guides so far. Such a concern for the relationship between design elements and the urban is certainly something to introduce either in the analysis or implementation of specific housing types. This means conceiving all the involved scales at the same time, making explicit the impact of a given solution in the creation of streets, public spaces, urban fabric, and morphology.

Despite the multi-scalar approach to building and block design, Hilberseimer defines a prototypical solution at the block scale, whose mechanical repetition creates a homogeneous and completely undifferentiated urban fabric. This is clear from

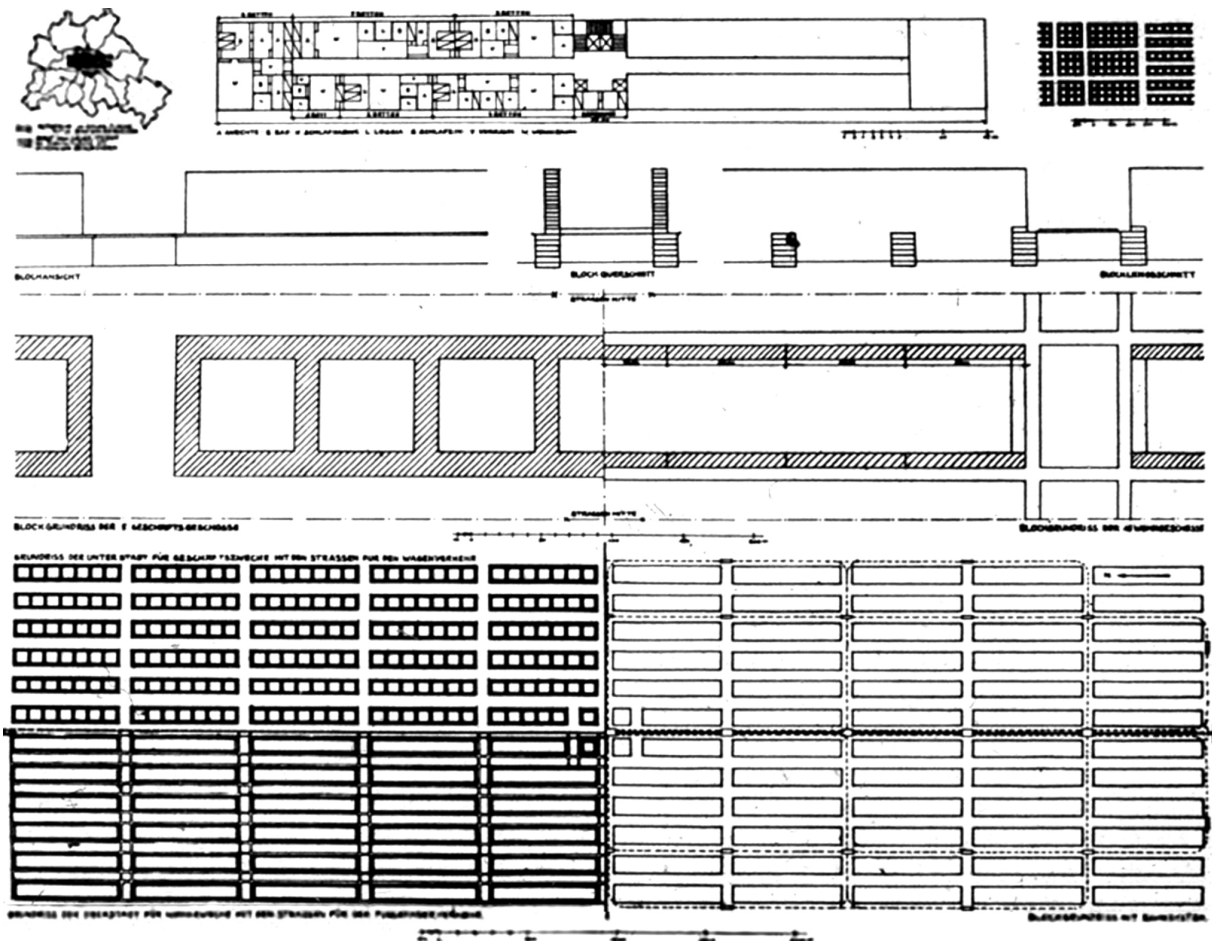


Figure 24
Plans and section of the Hochhausstadt by Ludwig Hilberseimer (1924). From *Metropolisarchitektur* (1927).

Manfredo Tafuri's reading of Hilberseimer in *Architecture and Utopia* (1976). Here, Tafuri states: 'since these cells are elements reproducible ad infinitum, they conceptually embody the prime structures of a production line that excludes the old concepts of "place" or "space"'.¹¹ Following Tafuri, the cell is not an isolated object but has to be understood in relation to its proliferation potential. This installs a logic for city planning, which ultimately creates a 'city-machine'¹². In fact, there are no intermediate scales or spatial and functional assemblies between the cell and the larger whole. This means that

architectural or urban 'exceptions' are changed by a rigid system of assembly of cells. The block is not seen by Hilberseimer as a compositional element that articulates larger in-between scales but a fixed solution driven by problems of functionality and efficiency. Thus, one can argue that Hilberseimer's attitude towards building and block design is against the nature of a housing design guide. Instead of prescribing ideal design solutions, it should provide design criteria able of creating a range of building and block arrangements. Apart from providing degrees of freedom to architects, it should allow for the creation of different urban assemblies and therefore multiple configurations of public space at different scales.

11 Manfredo Tafuri, *Architecture and Utopia: Design and Capitalist Development*, trans. by Barbara Luigia La Penta (Cambridge Massachusetts: MIT Press, 1976), p. 105.

12 Tafuri, p. 106.

Addressing the problem of variation, *Architecture Civile* by Louis-Ambroise Dubut (1803) is one of

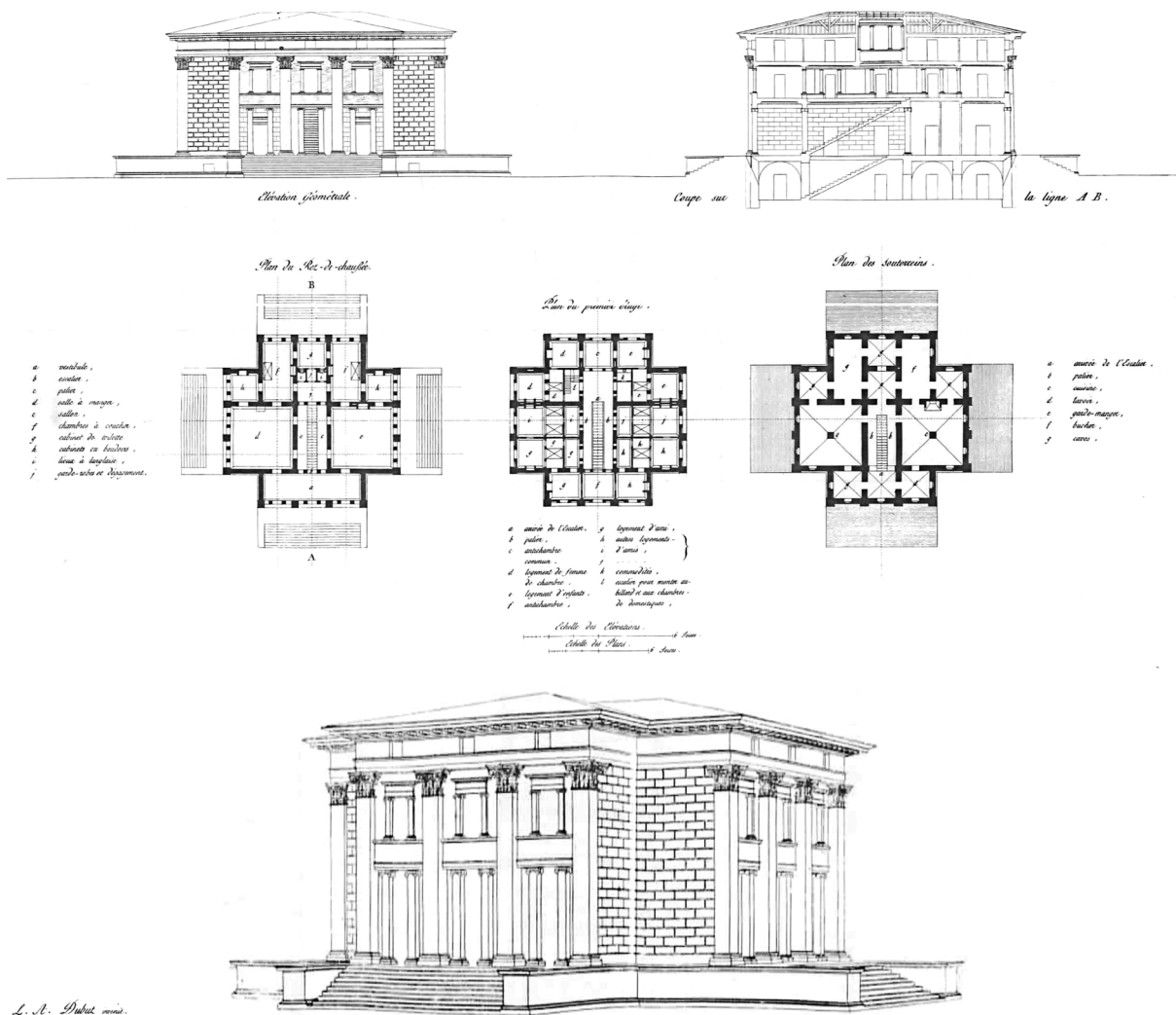


Fig. 25
Example of a housing solution by Louis-Ambrose Dubut. From *Architecture Civile* (1803).

the first attempts to provide guidance for housing design without prescribing fixed solutions.¹³ Dubut proposes a design document to be used without the assistance of architects. This consists of forty-eight examples of private houses based on the rationalisation of construction and building form (Fig. 25, 26). The houses are understood as the outcome of the taxonomical combination of building elements, which are not subject to problems of style. Decoration patterns were to be combined according

to their affordability and personal taste instead of fixed design solutions. Even though Dubut does not yet propose strategies to arrange housing examples at a larger scale, he does indicate a range of dwelling sizes and housing types (detached, row-house, and courtyard configurations) that can then apply to an urban or rural condition – depending on the design example (Fig. 27).

In the same line of thinking but focused on public buildings instead of housing, Jean-Nicolas-Louis Durand in *Précis of the Lectures on Architecture* (1802-1805) develops a design method with the aim to address an increasing number of programmatic needs. This is achieved by focusing on the composition of

¹³ Louis-Ambrose Dubut, *Architecture Civile: Maisons de Ville et de Campagne De Toutes Formes et de Tous Genres* (Paris: Imprimerie de J. M. Eberhart, 1803).



Fig. 26
Perspective of a domestic interior by Louis-Ambrose Dubut. From *Architecture Civile* (1803).

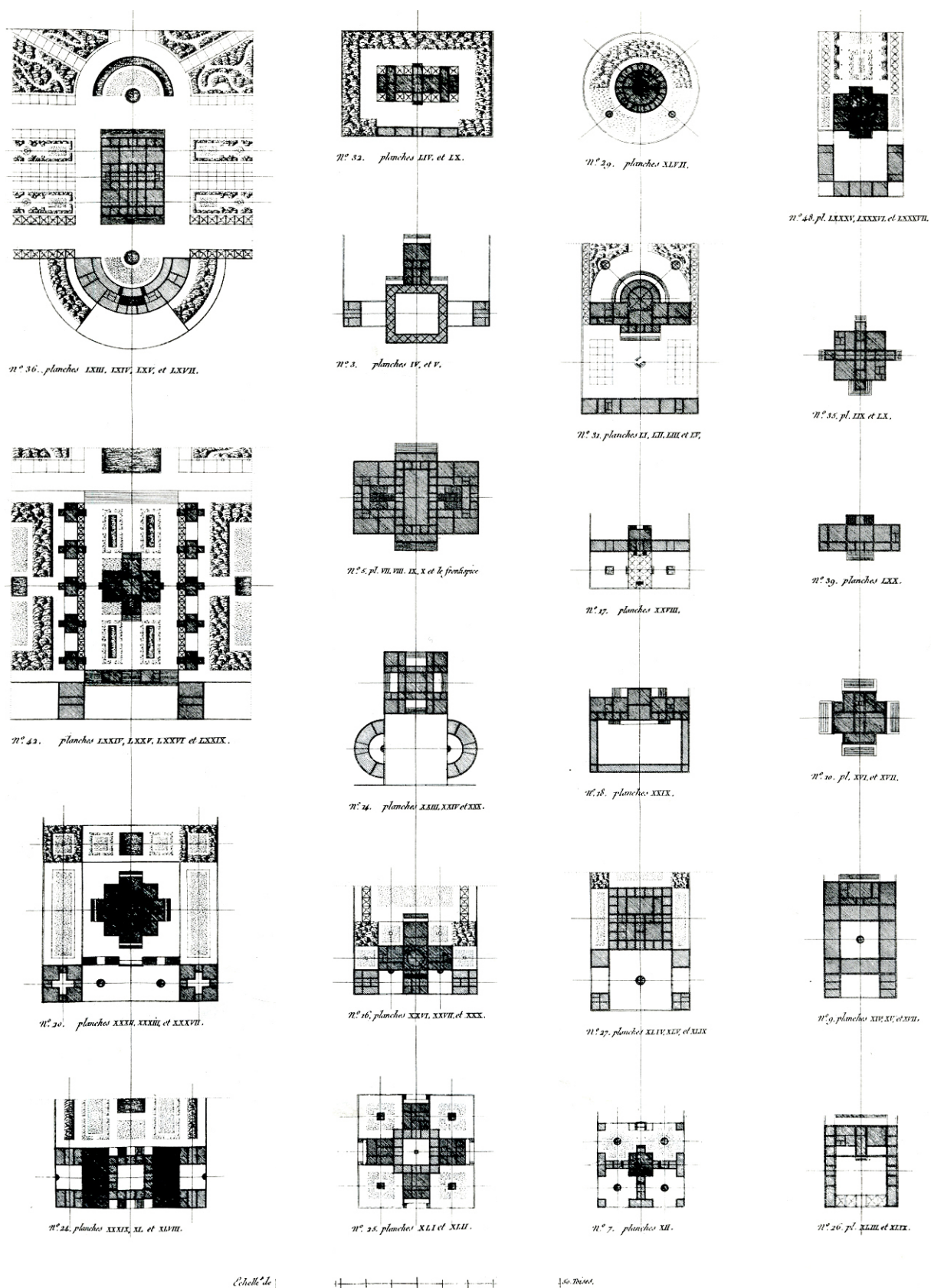
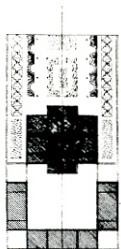
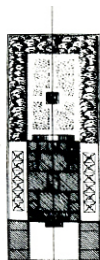


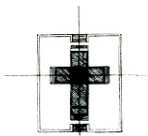
Figure 27
Matrix of housing solutions by Louis-Ambroise Dubut. From *Architecture Civile* (1803).



n° 48. pl. LXXXV, LXXXVI, et LXXXVII.



n° 34. pl. LVII, LVIII, et LXXI.



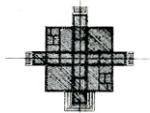
n° 19. planche XXXI.



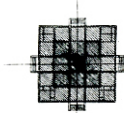
n° 35. fol. pl. LXII et LXVII.



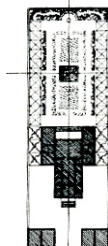
n° 28. pl. XLVI et LV.



n° 35. pl. LX et LX.



n° 41. pl. LXXII et LXXIII.



n° 38. pl. LXVIII, LXIX, et LXXVIII.



n° 37. pl. LXVI et LXXIII.



n° 33. pl. LXI et LXI.



n° 39. planches LXX.



n° 21. pl. XXXIV et XLII.



n° 18. planche XXV.



n° 45. pl. LXXXI et LXXXVII.



n° 43. pl. LXXVII.



n° 10. pl. XVI, et XVII.



n° 2. pl. I et II.



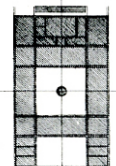
n° 40. pl. LXXI et LXXVIII.



n° 46. pl. LXXXII.



n° 8. pl. XIII.



n° 9. planches XIV, XV, et XVII.



n° 13. pl. XXI et XXII.



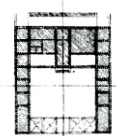
n° 44. pl. LXXX et LXXXIV.



n° 2. pl. III.



n° 6. pl. XI.



n° 26. pl. XLIII et XLIX.



n° 23. pl. XXXVIII et XLVIII.



n° 30. pl. I et LIII.



n° 22. planche XXXV et XXXVI.



n° 11. pl. XVIII.



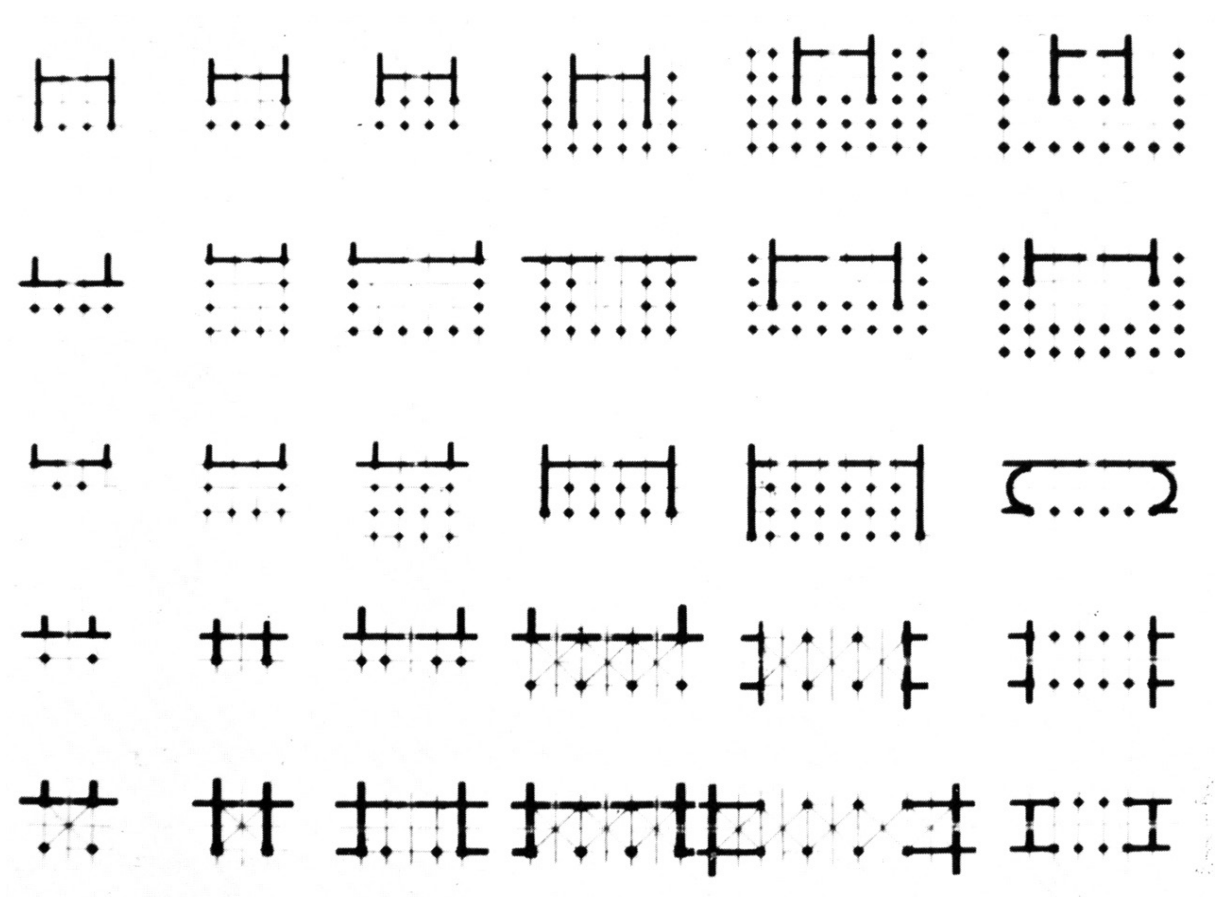


Fig. 28
Taxonomical classification of porches by Jean-Nicolas-Louis Durand. From *Précis of the Lectures on Architecture with Graphic Portion of the Lecture on Architecture* (1805).

buildings through the combination and assembly of constitutive parts, which leads to the creation of a variety of building arrangements. In doing so, Durand weakens the meaning of classical elements by reducing them to a grammar consisting in typical building elements that are part of a taxonomic system of combinations (Fig. 28, 29). The rearrangement of these is seen by Durand as a means for invention and possibility to deal with the problem of form.

Through the taxonomic approach to design proposed by Dubut and Durand, the resulting arrangements are always in relation to a system of possibilities. That is to say, form is not subject to an ideal and fixed design, but to a range of solutions. Learning from this, the housing design guides should incorporate strategies for creating design ranges such as taxonomy does. The paradox is that the taxonomical approach already exists in housing design guides. This is, for

example, the case for the *London Housing Design Guide*, which provides a furniture schedule according to room functions and dwelling size. However, when the design guidance moves to larger scales, taxonomy is completely abandoned. One of the possible reasons for this is that each urban context is highly specific, making accurate and general design guidance difficult. But the answer to this problem lies precisely in the nature of taxonomic design. It defines relationships between parts, which can manifest themselves in different ways according to chosen design parameters.

Bringing the idea of variation to the scope of the housing design guide, a matrix can bring together issues that have historically not been considered combining different housing arrangements with a number of specific and highly differentiated urban issues.

Housing and the Right to the City

As discussed earlier in the thesis, through the implementation of neoliberal ideology, in our case in Chile, the state has moved away from its responsibility to maintain the welfare aspects of housing. These consist of social, political, economic, cultural and institutional (constructions) structures that ultimately shape the built environment and determine the way people live. Housing represents a significant part of state investment and is the largest item in household expenditure. In fact, according to Jim Kemeny, although its relevance is usually underestimated, housing can be understood as important as the other pillars of welfare provision – such as social security, education and health care.¹⁴ It has a crucial role for governance and key aspects of everyday life, such as security, health, and well-being.

In these terms, housing ought to be considered/ treated as a long-term political responsibility. This would require a different regulatory and conceptual framework. Under the current legal conditions, there are no constitutional grounds, which hinders the political commitment to this problem.¹⁵ Although the Chilean state has signed several international treaties that recognize the universal right to housing – these are based on Article 25 of the United Nations Declaration of Human Rights, stating that everyone has the right to a standard of living, adequate for health and well-being, for himself and his family – the current Political Constitution of Chile does not explicitly address this problem. In fact, housing is the only fundamental right that has not been acknowledged by this Constitution. To begin with, housing should therefore be defined as a social right through a different constitutional

arrangement.¹⁶ Otherwise, as it happens under the current political framework, the amount and quality of housing provision is entirely based on the government in office's will to deal with it.

Not only must housing be included in the constitution as human right, but it also needs to be recognised as an essential part of the social welfare. That means housing as shaping common interest instead of solely responding to an individual need. Looking at the barely regulated housing policy, one of the core issues of the neoliberal discourse is replacing issues of common interest – subject to be framed under social welfare ideology – by a sum of individual demands. But housing, as analysed previously, is not only about providing individualised biological needs. It is also to be determined by and determine urban problems, which have impact upon the collective and the social. Kemeny describes this in the following way:

'Housing' is a substantive focus – a focus upon dwellings; it is not a pole of a dichotomous concept, as is an urban focus, and so cannot be integrated with a polar opposite in the way that urban and rural dimensions can be combined to create a socio-spatial regional dimension. It would seem more appropriate to develop a conceptual basis for housing by refining the concept of housing in a parallel manner to the refinement that has been taking place of the concept of welfare in social administration.¹⁷

The right to housing thus, also means a right to the city and therefore to specific modes of living in

14 Jim Kemeny, *Housing and Social Theory* (London: Routledge, 1992).

15 Creating a new and more comprehensive constitution is part of the political agenda of the current government. This is now debating about the legal means to derogate the existing one, which was created under dictatorship with the aim of setting the basis for the development of neoliberal policies.

16 This goal can be framed through a constitutionally mandated statutory duty. That means the duty of the legislation, grounded in the constitution, to develop a comprehensive housing policy, whether through governmental agencies, independent institutions or citizens associations.

17 Kemeny, p. 8

common. If the access to housing is secured for all, any individual has the right to participate not only in the city but also in a broader political community. Returning to the earlier discussion on the relationship between the building and the block, it is therefore necessary to acknowledge the importance of building and block design in organizing the domestic domain as an aspect and part of the urban. This could translate into a design framework that can accommodate a diversity of social groups by including differentiated forms of housing.

Expanding the Housing Policy

Although a new constitutional framework can change the status of housing into a social right, it is required a more specific idea for its provision. To do that, Bo Bengtsson argues that it is necessary to distinguish between selective and universal regimes. The selective one allocates housing to people who are not able to pay for a dwelling in the general market. In a universal regime, instead, the state corrects the general housing market in order to ensure a provision of social housing. This way, the first has a legalistic approach, whereas the second is based on broader social concerns. Bengtsson defines selective and universal regimes according to the *width* of the policy field. In the case of the universal sector, it has a *wide* policy field. This means including the whole social spectrum within the policy scopes. This approach conceives only one housing market through which all demands are answered, without regard to the economic limitations of households. On the other hand, the selective approach has a *narrow* policy field. This only targets households with limited economic resources. This leads to a split system of provision, an open market and a protected sector. The first is free from state intervention and the second consists of a clearly defined stock of houses that can access subsidies or regulatory mechanisms to ensure their affordability.

Bringing this discussion to the context of Santiago, although a selective regime can fulfil the demands of low-income groups, it does not necessarily recognize the real magnitude of the housing deficit. This is not

only of dwellings but also urban elements (in terms of design and infrastructure), which affects most income groups and different forms of households. However, if the right to housing is seen from a universal perspective, it requires a comprehensive strategy. In concrete terms, if the state commits to both solving the remaining official deficit (200,000 dwellings) and to amending the mistakes made since the implementation of the low-income housing policy (resulting in 800,000 subsidized dwellings), it would mean building 1 million new houses. This is equivalent to half of all existing houses in Santiago and would require a massive effort by the state.

Resolving the deficit seems to be a large-scale problem. However, for bureaucrats this might be exaggerated considering two arguments. The first is that most of the housing provided between 1980 and 1990 is already located in the city and has good access to the public transport system. Its strategic location creates a demand for its land, whose price is much greater than the cost of a low-income house. This makes the plot a commodity that allows buying an adequate house in the existing real estate market. The second aspect to consider is that several housing beneficiaries have overcome poverty, being now in a situation to pay for better housing. But one can argue that despite some people now being able to afford significantly better dwellings, they can hardly access secondary or tertiary infrastructures. These are related to commerce, services, work, and higher education (university or technical) on the one hand, and public spaces and associated facilities on the other. The access to them is, apart from capital investment, determined by the building and block design creating a system of spatial proximities producing thereby urban spaces open to all.

The above brings us back to rethinking the general access to home ownership. Even though the Ministry of Housing and Urbanism recently estimated the housing deficit at around 400,000 dwellings – representing 20% of Santiago's housing stock – not all families in need of housing belong to the lowest socioeconomic strata (group E, defined by extreme poverty). According to recent studies, this group represents no more than 10% of Santiago's inhabitants and its members are considered unable to meet their

basic daily needs, which make them totally dependent on the state's social welfare programmes. The rest of the housing demand comes from group D. This is the largest socioeconomic strata and represents 35% of Santiago's population. Unlike those belonging to group E, group D members have financial means and can consume as well as assume debt. Despite their debt capacity being very low, they are in employment and can take out long-term housing loans.¹⁸ They aspire to improve their financial and social standing, whereas those in group E often fight for biological survival. Considering these major differences, can both income groups be treated in the same way by providing general access to home ownership and therefore assuming the financial responsibilities that this form of housing requires in the long-term?

This is a fundamental problem that the current low-income housing policy does not recognize. It only proposes a staggered system of subsidies that gives funds according to the economic limitations of households. By doing that, the answer is always providing home ownership, without accounting for the ability of people to effectively overcome their financial circumstances. Taking this into consideration, defining housing as a social right means creating a regulatory framework capable of acknowledging the main socioeconomic differences. This is possible by expanding the scopes of the housing policy, distinguishing among social housing, affordable housing, and private housing, through which the specific social needs can be met.

Social housing is rented housing owned, managed and maintained by the state (local authorities such as municipalities) and is provided to families whose needs are not met by the market. The provision of housing is therefore guaranteed regardless of economic constraints of its beneficiaries. As a public service, this form of housing is not subject to profit. To do that, the state has to make use of public resources – financial, administrative, and legislative – to ensure the provision of quality

housing. Responding to similar concerns is affordable housing. This is rented accommodation provided by independent societies, companies or cooperatives (such as housing associations) on a not-for-profit basis. To remain affordable, this housing model can access state funds (such as subsidies) and regulatory exemptions.¹⁹ Affordable housing can also come with private housing or shared ownership, using its trading surplus to maintain existing and help building new rented homes. Finally, there is private housing, which is essentially for-profit housing. Despite its commercial focus, this housing can be required to meet, for instance, a minimum rate of housing for low-income groups. This can be sold either to the state, to then be let out as social housing, or to individuals as intermediate housing through long-term equity loans.

Based on the above, recognising different forms of housing does not mean limiting the state's scope of action only to people living below the poverty threshold. The challenge is to create a broader housing framework that has the ambition of creating an urban environment accessible to all. To do that, it is necessary to acknowledge the economic limitations of different income groups by introducing building and block design strategies that bring together different forms of housing and infrastructures.

The Typological Stigmatization of Housing

The contextual problems of building and block design are mainly determined by the socioeconomic differentiation of housing types since the implementation of neoliberal housing policies. This has deeply affected low-income groups, who have witnessed a process of urban segregation and social stigmatization. The reason for this is their inability to access a full variety of urban and infrastructural provisions. One of the most important defaults of the housing policy is the total lack of state funds to deal with maintenance (Fig. 30).

18 This becomes clear looking at high-end housing subsidies. These target low-to-mid-income groups and require savings or bank loans to access state funds.

19 The collaboration and supervision of the state in the creation of affordable housing is essential in order to provide and ensure the same quality of a public-driven housing.



Fig. 30
Image of communal area typical for the stigmatized housing solutions. Photo by Tai Lin Muñoz.

The design precepts given by neoliberal policy are evident looking at the subsidy-based housing build between 1980 and 1995. The *Basic Dwelling Programme* (1980), *Plots with Sanitary Infrastructure Programme* (1985), and *Progressive Housing Programme* (1990) share the same design principle: all dwellings are autonomous units with direct access from the street (Fig. 31, 32). Also, each dwelling is provided with a private front and back yard, which eliminates any form of communal space in the interior of the block – which might otherwise be subject to maintenance problems. This creates a housing block whose width ranges between 30 and 60 meters, leaving a length that varies from 60 to 250 meters. The outcome is an undifferentiated proliferation of houses from 1 to 2-storeys, producing a density between 500 and 600 inhabitants per hectare.

The need to achieve larger densities led in the 1990s

to new typological arrangements such as the ones proposed in the Comunidad Andalucía by Fernando Castillo (1992) (Fig. 33, 35, 36). It combines a range of row housing, from 2 to 4-storeys high. The most unique arrangement is the 4-storey type, which is possible by stacking two housing units and introducing a staircase and a connecting bridge. This way, it becomes denser, similar to a slab block. In addition to this, the block interior ceases to be totally private and becomes a hybrid of pedestrian streets, squares and private front and back yards – depending on the row housing type. Although the Comunidad Andalucía introduces spaces for social interaction in the interior of the block, this does not take into account its urban context and shows total disregard for both the street as a public space and infrastructure. It is rather a gated housing community.

The ideas explored in the Comunidad Andalucía were

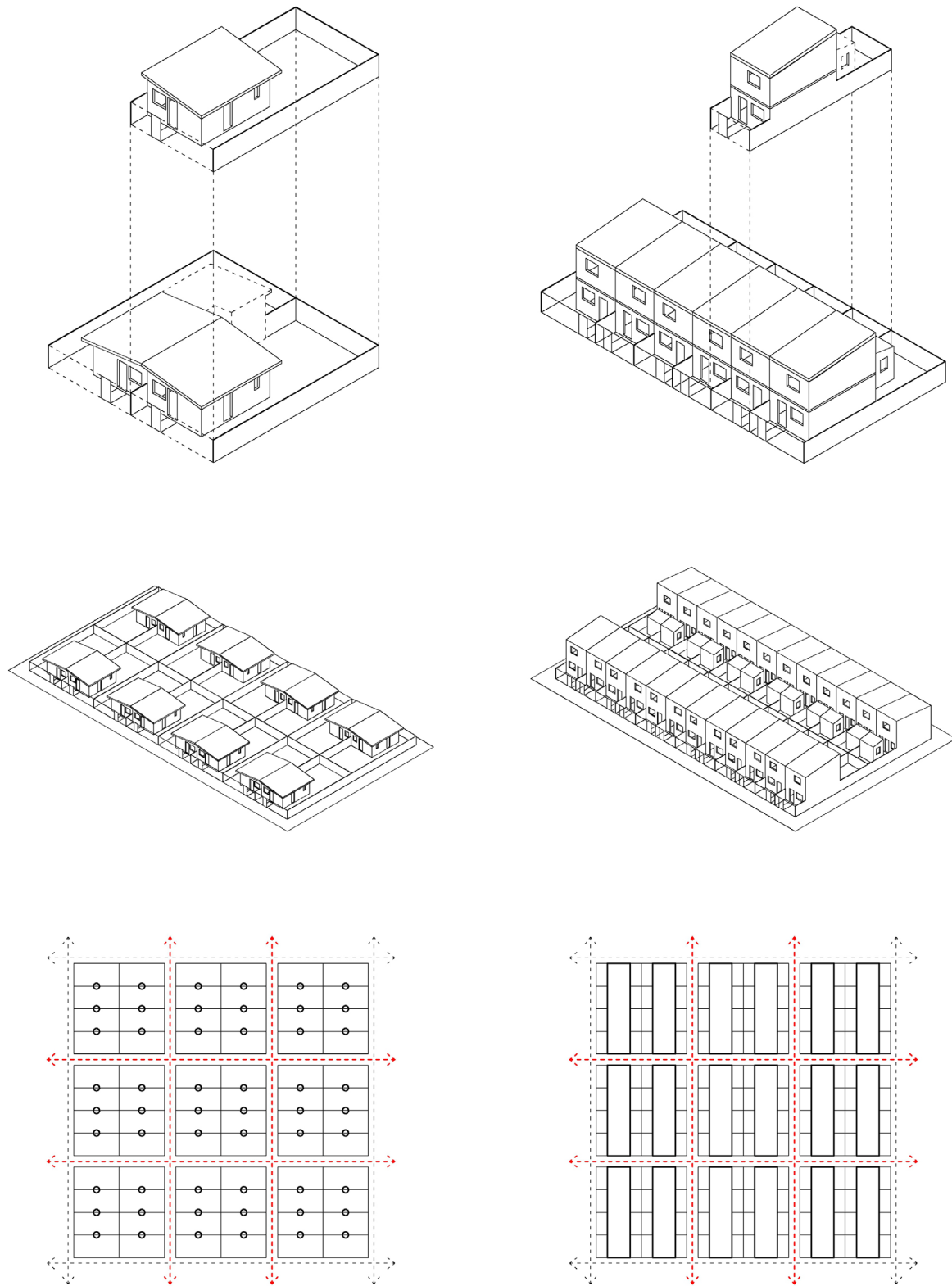


Fig. 31 - 32 (from left to right)
Housing types and systems of urban proliferation from 1980 to 1992.

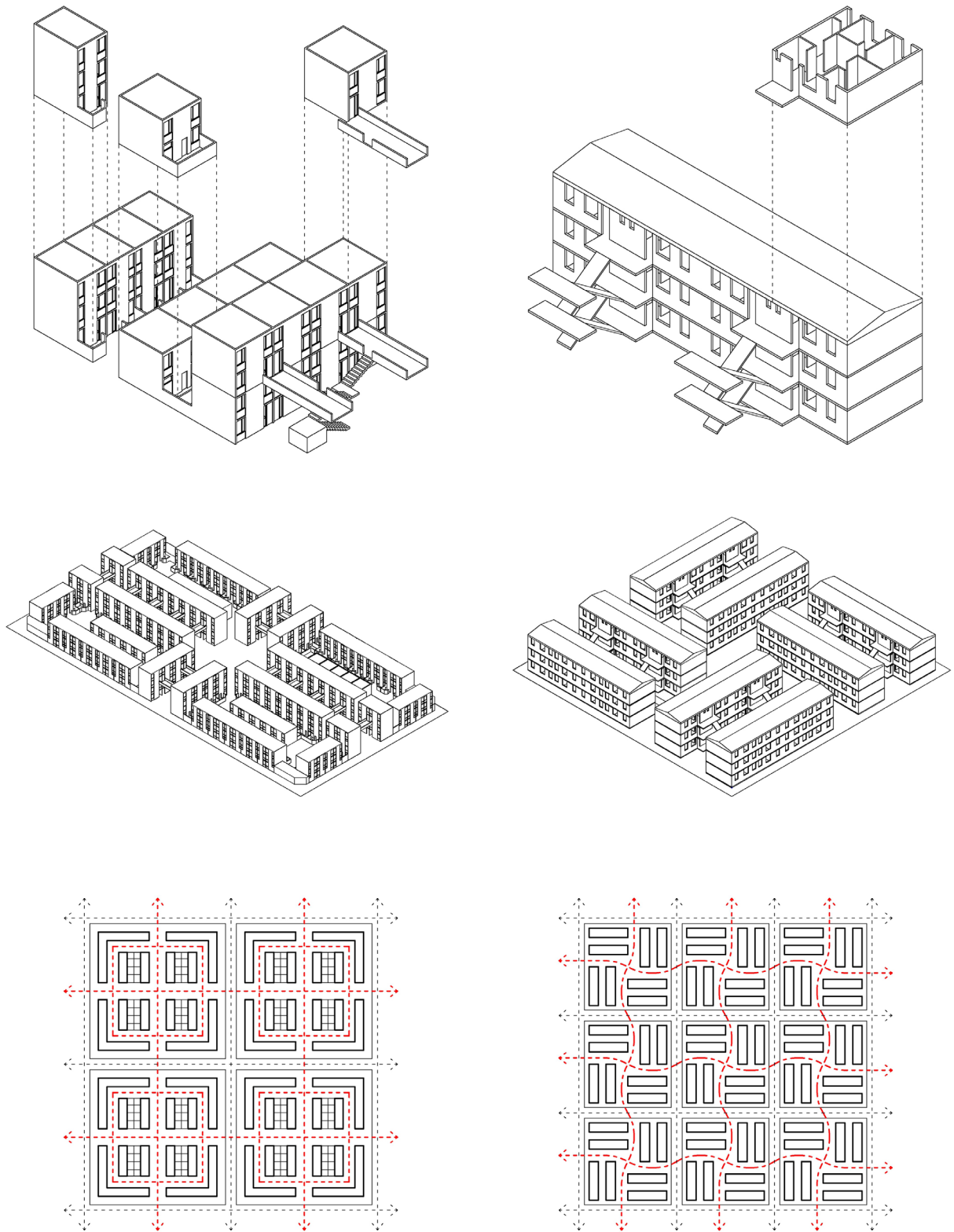


Fig. 33 - 34 (from left to right)
Housing types and systems of urban proliferation from 1992 to 2000.

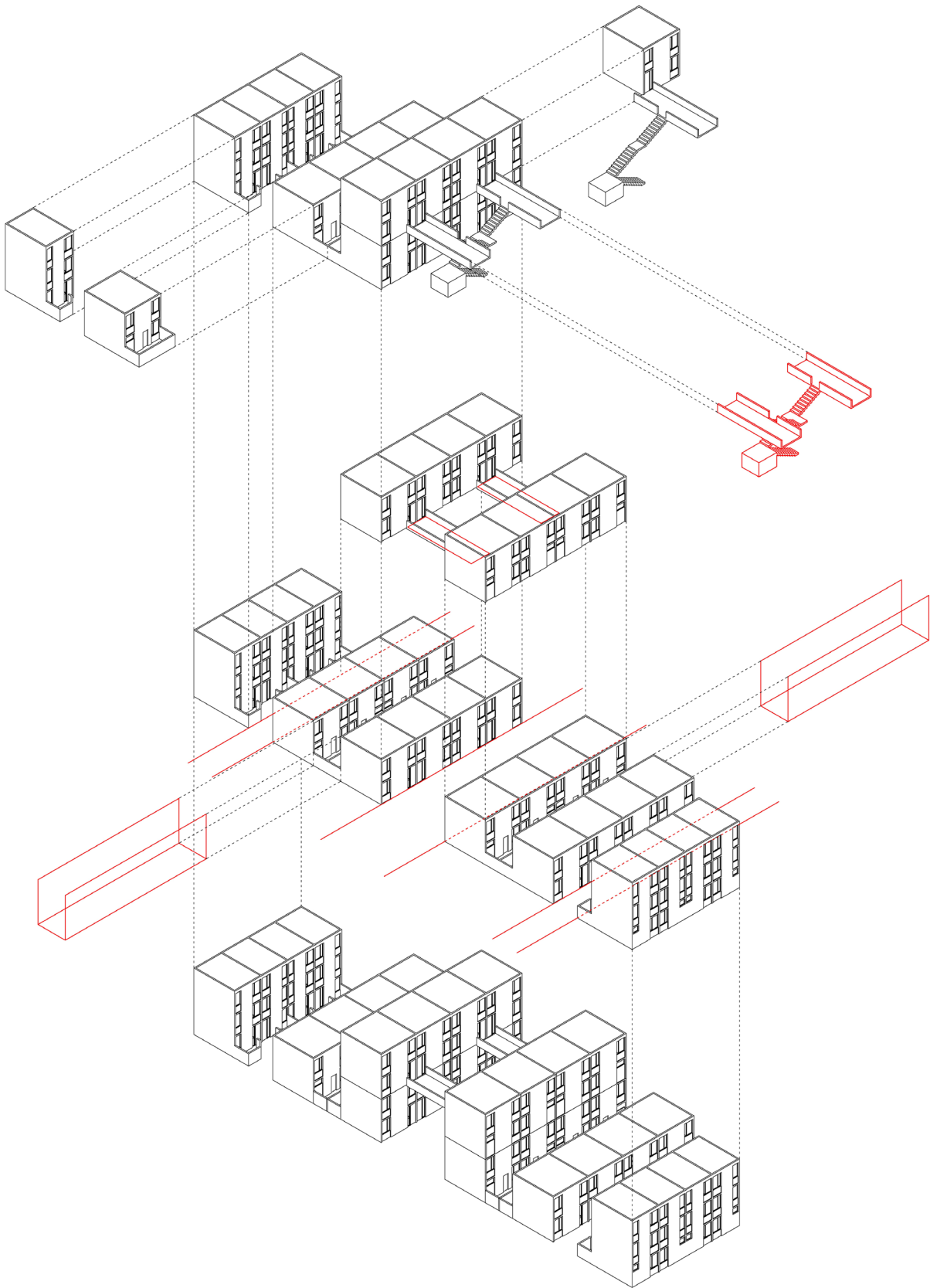


Fig. 35
Axonometric drawing of the main building elements of Comunidad Andalucía.

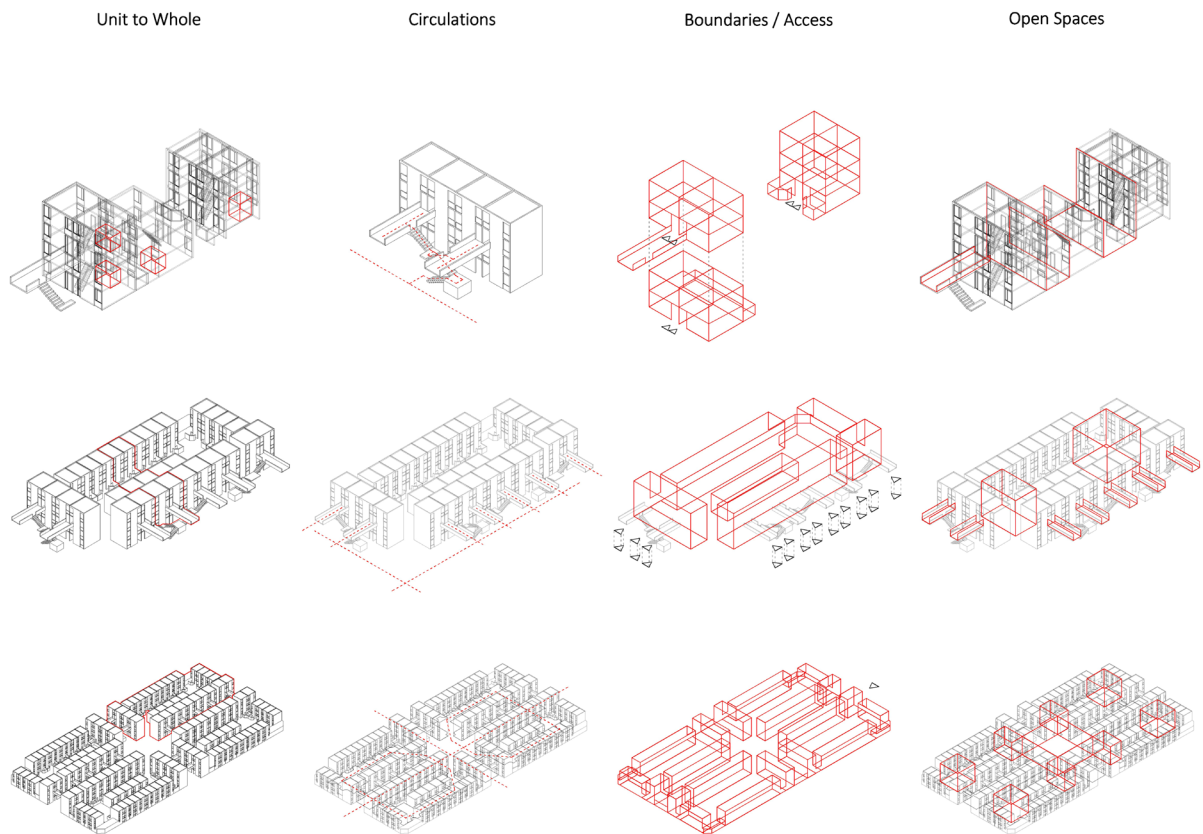


Fig. 36
Drawing analysis of Comunidad Andaluía.

radicalized in 1995 with the need to increase housing density. The row house as a ruling model was replaced by housing of 3 to 4-storeys, most commonly a slab block arrangement called *scissors slab* – alluding to the crossing staircases connecting its facing volumes (Fig. 34). Unlike preceding housing, this block model does not have a clear differentiation between interior and exterior, or public and communal spaces. It is rather the outcome of a block scheme that maximizes density in an inexpensive brick construction.²⁰ The general arrangement is given by four interlocked *scissors slabs*, creating a block size of around 60x60 meters with an average density of 1,200 inhabitants per hectare. But, as the function of communal spaces is unclear, there are ownership problems. Nobody

takes responsibility for them and therefore these spaces are often mis-appropriated or abandoned. In addition to this, all dwellings are accessed from the interior, thus, having no relationship with the street. Apart from creating security issues, this prevents mixed uses such as commercial areas or working spaces.

Criticising these housing solutions, the architecture studio Elemental proposed a different strategy to deal with problems of density, ownership, and communal areas. Elemental reduced low-income housing to a simplistic typological strategy. This has enforced a phenomenon of typological stigmatization (Fig. 37).²¹ Elemental has identified vertical shared spaces and internal circulations as the very sign of the ownership

²⁰ This system can only be applied in low-rise and mid-rise buildings due to Chilean seismic standards. High-rise buildings are, instead, much more expensive due to they need to be built with a significant proportion of reinforced concrete, which is unaffordable according to the budget destined to housing subsidies.

²¹ Stigma is a word meaning a sign, point or branding mark, which makes its carrier to be included within a specific category, generating a negative response, and is seen as culturally unacceptable or inferior.

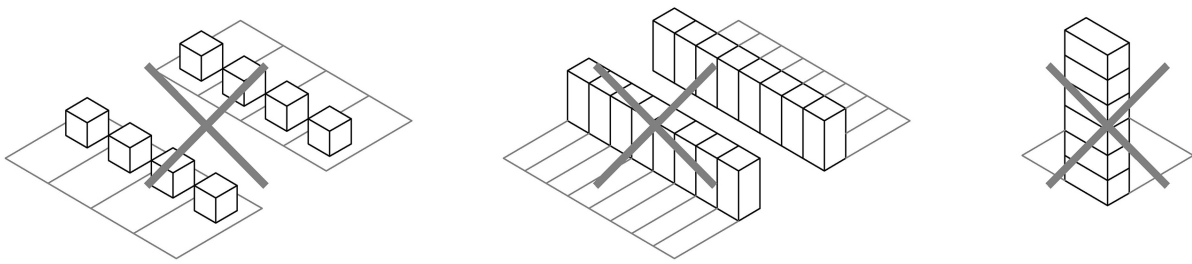


Fig. 37
Typological stigmatization diagram by Elemental.

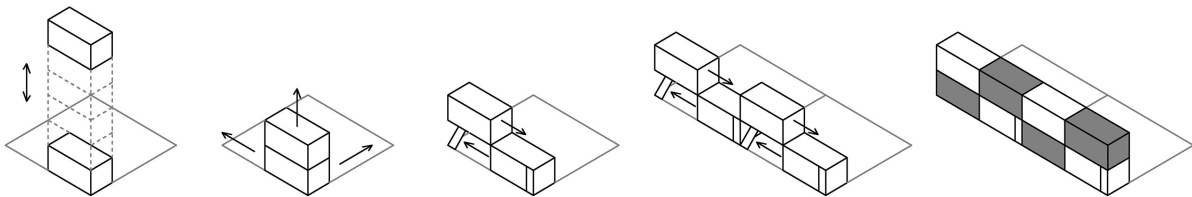


Fig. 38
Row house and ownership diagram by Elemental.

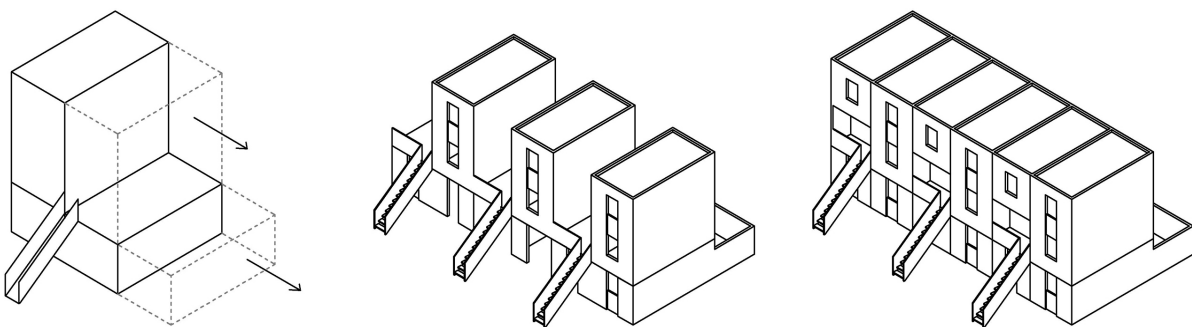


Fig. 39
Elemental's row house arrangement.

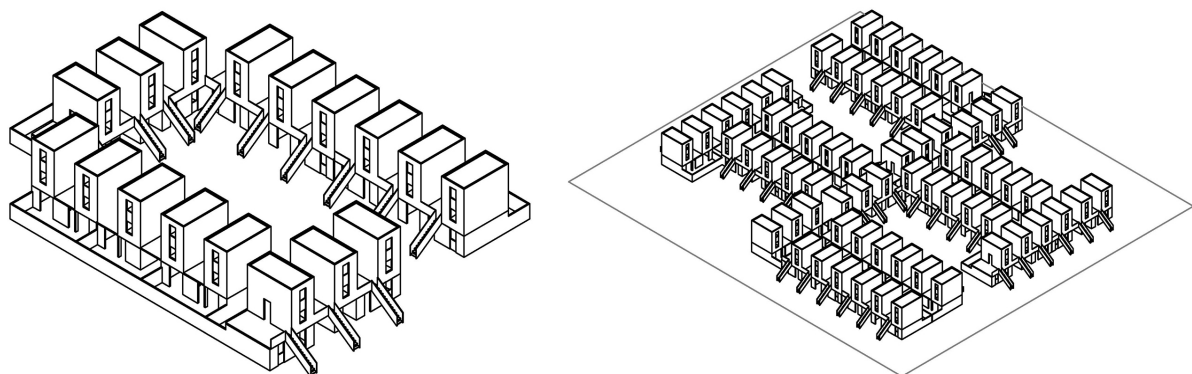


Fig. 40
Elemental's courtyard arrangement.



Figures 41 - 42

Transformation from detached houses to row houses. Photos by Cristobal Palma.

problem. This conclusion discards mid and high-rise housing types, limiting design to a single and predetermined solution (Fig. 38). According to Elemental:

So it could be said that in order to face the problem of social housing, the following equation will need to be solved: low-rise, sufficiently dense projects without overcrowding and with the possibility to grow. Low-rise is necessary to eliminate common areas like halls and elevators that cannot be maintained and may as a consequence cause deterioration and value loss.²²

Thus, Elemental proposes a 3-storey building that overlaps two dwelling units. This revisits the row house, which is seen as an affordable and socially desirable type. The proposed building successfully deals with ownership issues by clearly defining the spatial boundaries for future dwelling extensions – thus allowing to complete the final row house

configuration. Besides, the buildings are in most cases arranged around a courtyard. This creates a semi-private space grouping 15 to 20 houses, a number that is considered small enough for dwellers to administrate the communal area themselves, preventing ownership appropriations, and providing security (Fig. 39, 40, 41, 42).

Although the scheme proposed by Elemental has a clearer approach to individual and collective ownership, it is still a problematic design solution. First, its density does not exceed 500 inhabitants per hectare. This is a very low density compared with the ones found in mid- and high-rise housing types, which makes the price of land significantly more expensive – this has a direct impact on the location of low-income housing, especially at the metropolitan scale.²³ Second, the communal area, the organizing space, is mainly a parking lot (Fig. 43). This means it is devoid of any socio-educative role. This condition is exacerbated by the scheme consisting only of housing, completely separating housing from other functions and creating a highly segregated urban model in social, economic, and infrastructural

²² Aravena, Alejandro, Andres Iacobelli, *Elemental: Incremental housing and participatory design manual* (Ostfildern: Hatje Cantz, 2012), p.21.

²³ This problem will be more clearly explained in the fourth chapter



Fig. 43
Internal open spaces as parking lot. Photo by Carmen Sanchez Reyes.

terms. Third, when looking at the proliferation of the courtyard scheme at larger scales, it has problems in defining the block boundaries and therefore an overall (collective) form. The block is the outcome of interlocked courtyards, leaving two corners of the block undefined. The lack of clarity in defining the block form reflects on the neighbourhood scale. As is evident in the Lo Barnechea II housing project, the overall form is ultimately given by the need to adapt the block scheme to large plots, without considering a clear urban space or fabric that can establish a compatibility with other forms of housing, building types, and infrastructures (Fig. 44).

Elemental's lacking concern for principles of urban design, disregards one of the greatest strengths of early row house examples from the early twentieth century. In this period, the row house became a mechanism to densify and reinforce an already consolidated urban (colonial) fabric largely made up of courtyard housing. The row house was well suited

to occupy undeveloped block interiors through a system of pedestrian streets that formed a secondary fabric for the city (Fig. 45, 46, 47, 48). The so-called *Cité*, a street-based housing model, created a new kind of domestic space, and introduced an intermediate and communal scale between the public and private realm. As Oscar Arteaga describes:

The *Cité* is a set of houses brought together through a continuous façade that frames a common space and connects with the public realm through one or more accesses. Its name comes from a very unique way of relating with public spaces, which recalls the 'Cité' or the walled medieval citadel.²⁴

24 Oscar Arteaga, 'El cité en el origen de la vivienda chilena [The cité in the origin of Chilean housing]', CA. *Revista Oficial del Colegio de Arquitectos de Chile*, 41 (1985), 18-21 (p.18) [author's translation from Spanish].

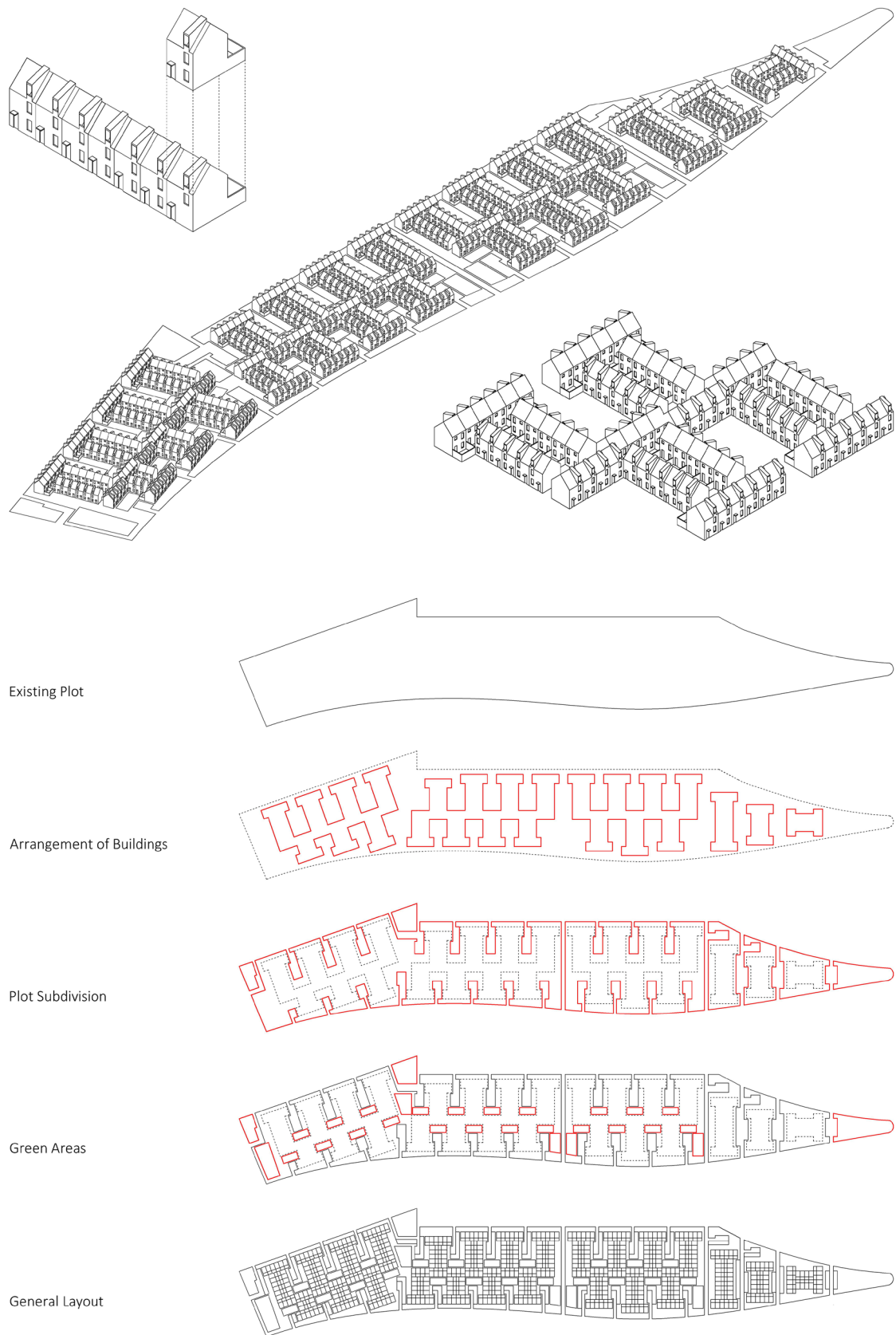


Fig. 44
Axonometric drawing and general layout of Lo Barnechea II housing project.

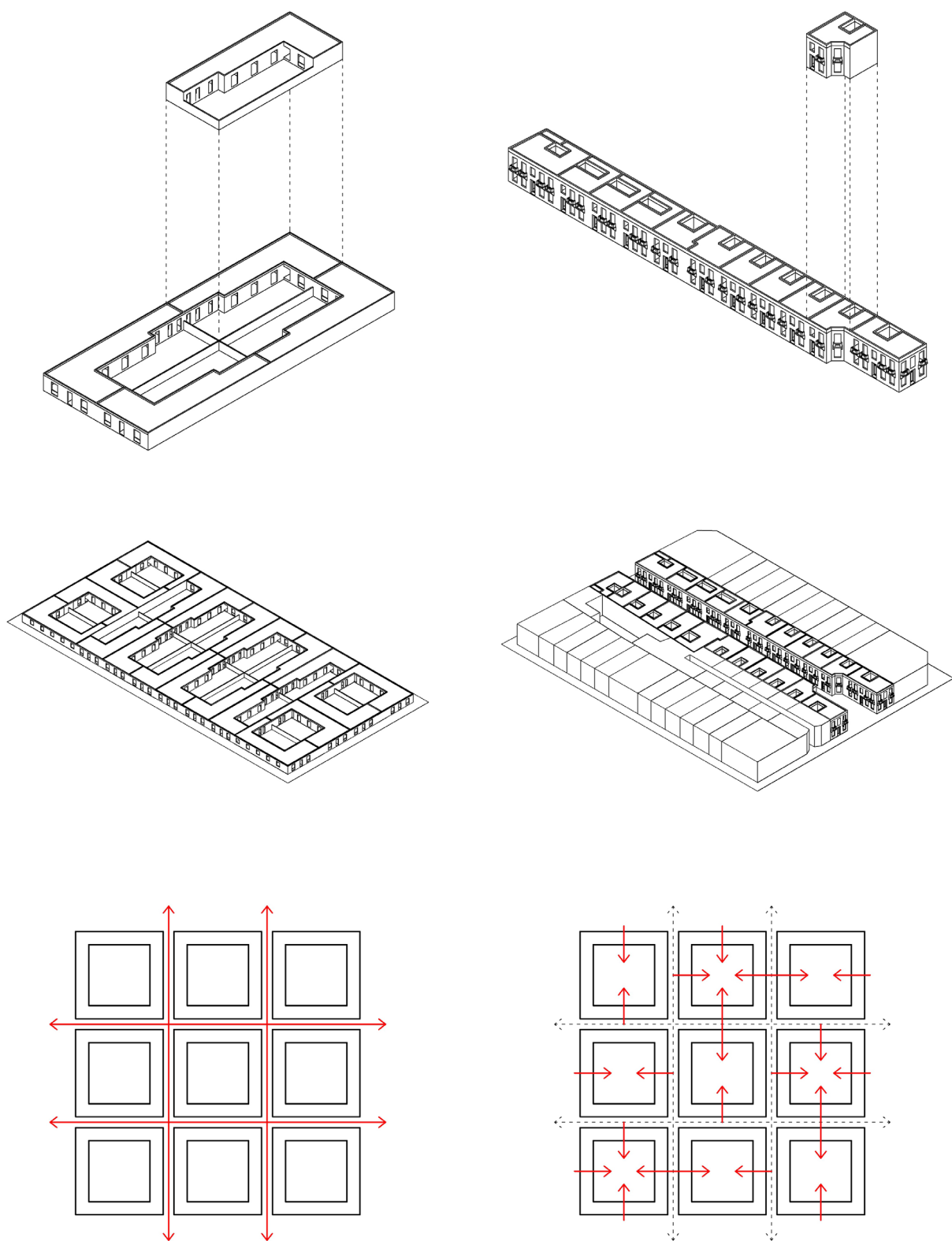


Fig. 45 - 46 (from left to right)
Housing types and systems of urban proliferation from 1910 to 1925.

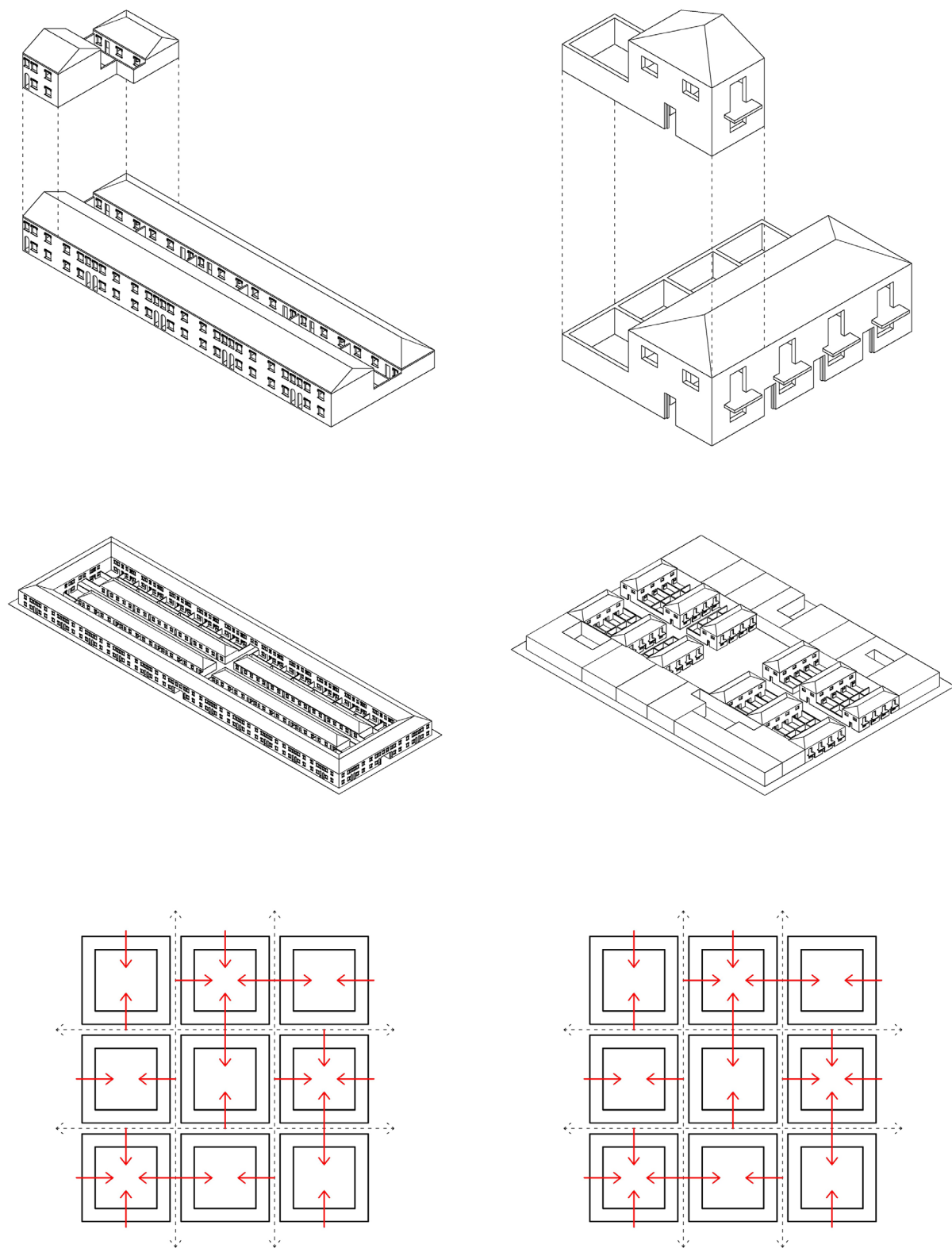


Fig. 47 - 48 (from left to right)
Housing types and systems of urban proliferation from 1925 to 1940.

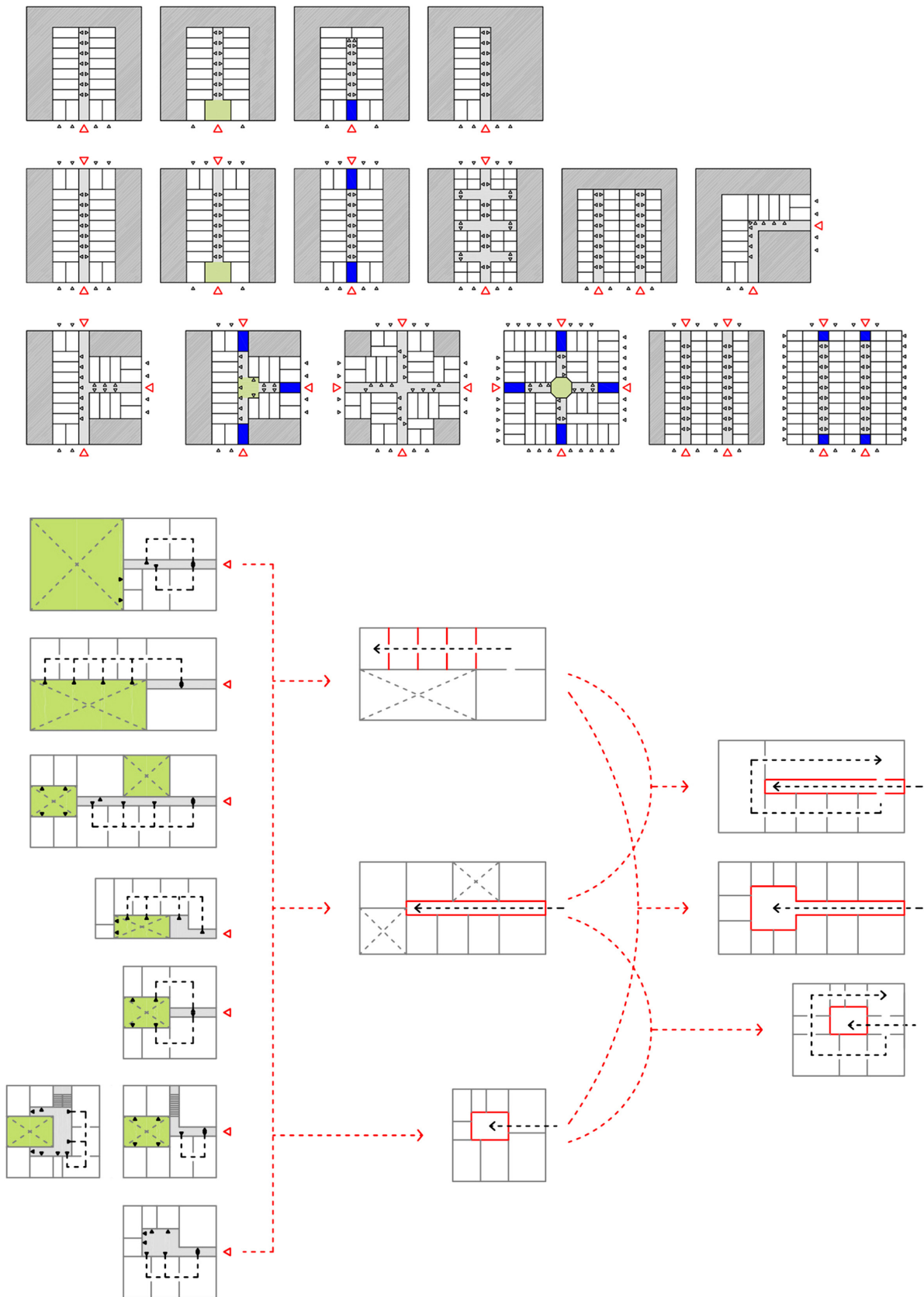


Fig. 49 - 50

Above: Cité's typical block arrangements: linear and grid. Below: Cité's typical building arrangements: centralized, linear, and enfilade.



Fig. 51
Cité's typical interior.

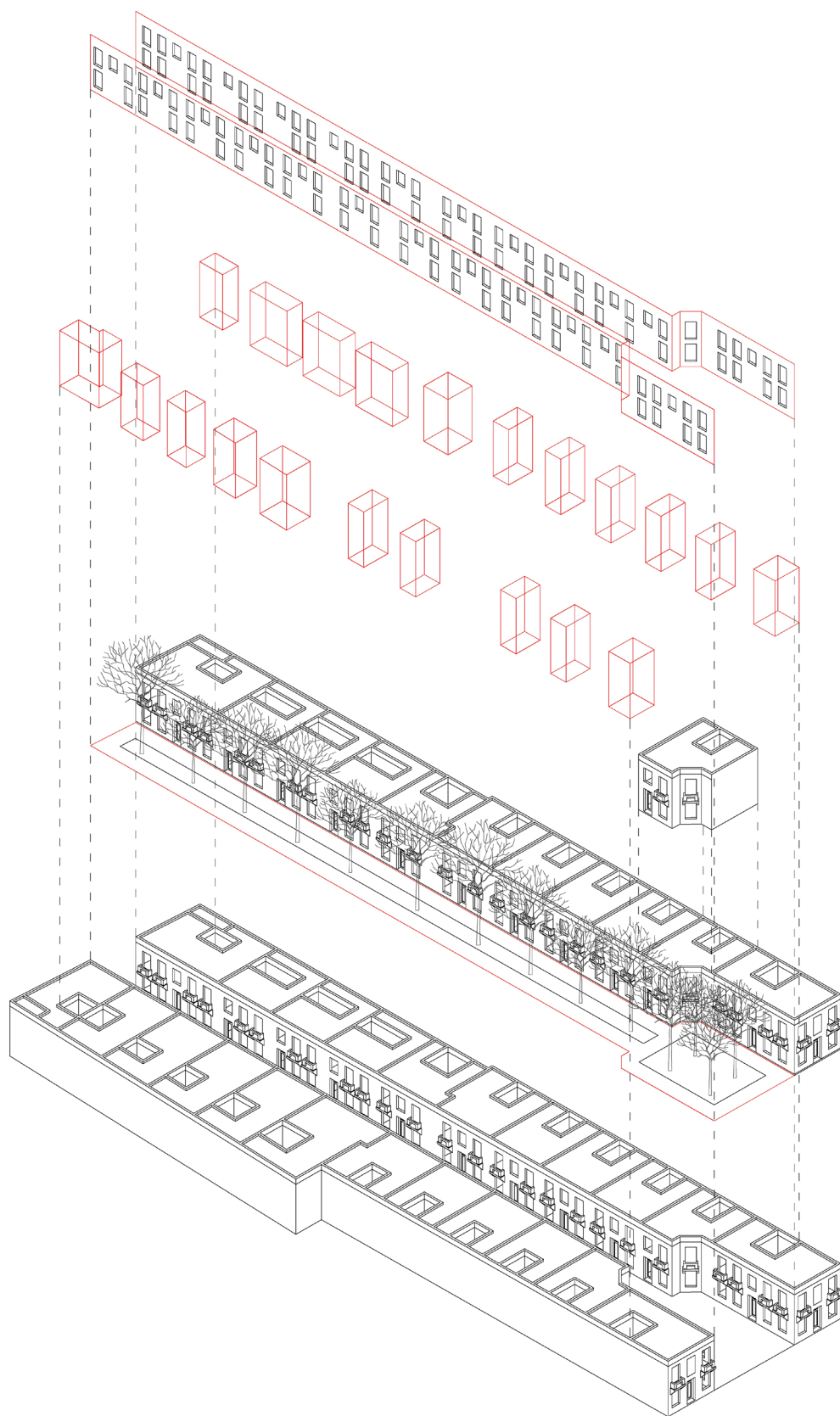


Fig. 52
Axonometric drawing of Cité Adriana Cousiño.

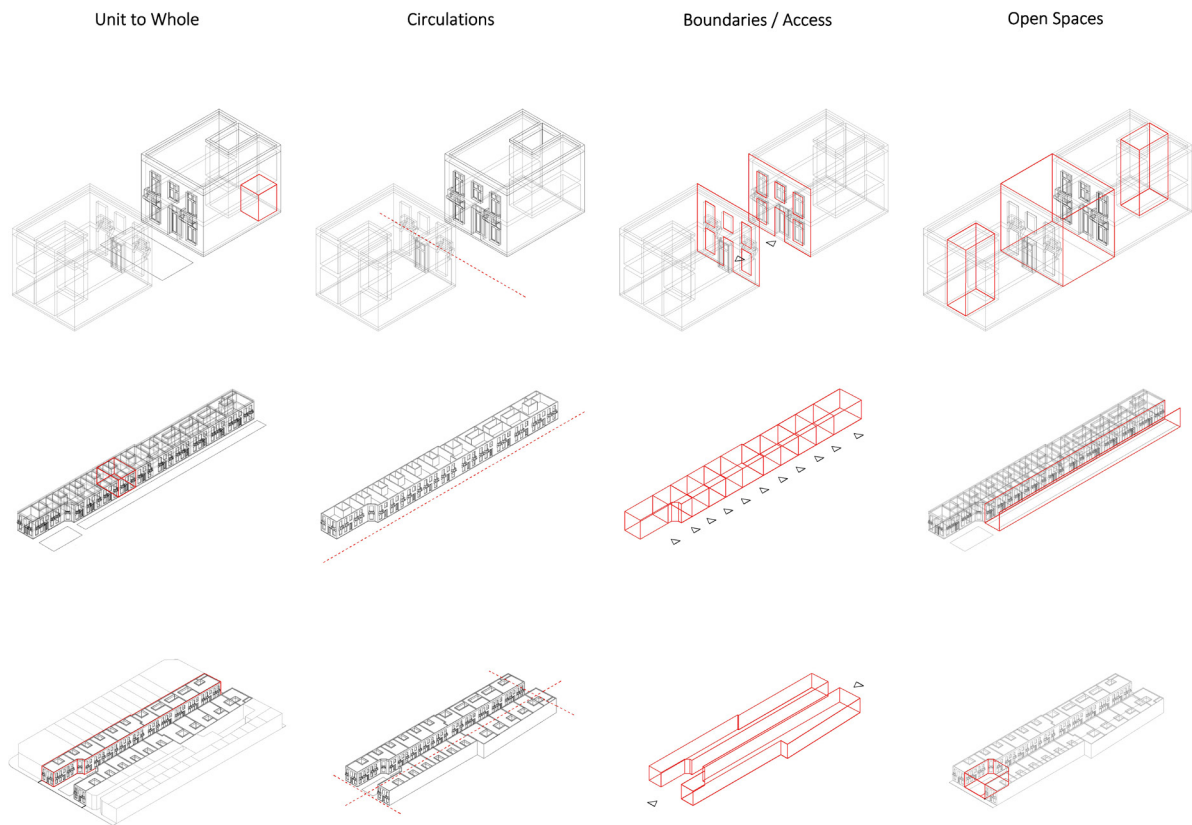


Fig. 53
Drawing analysis of Cité Adriana Cousiño.

The continuous façade – usually of 1 or 2 storeys – is the main architectural element of the Cité, being capable of adapting to multiple plot sizes and block forms. This makes of the Cité a versatile urban solution that can develop in an interstice or as a full block. Also, it can produce linear or grid arrangements, which can include other architectural elements such as hallways and green areas at the entrance, centre or along the street. All these elements are combined in multiple ways and thus create a range of possible solutions that adapt according to the specific urban conditions of each case (Fig. 49).

A notable aspect of the Cité is that it played an important social role. While the façade has a neutral and unified appearance towards the exterior space, it conceals a differentiated building interior made of multiple dwelling solutions organized according to centralized, linear, enfilade, and mixed arrangements (Fig. 50). These solutions ranged from 35 to 80m² and targeted families belonging to different income

groups. Thus, apart from installing a coherent typomorphological and urban system, the Cité also became a model for social and functional integration. Particularly when the Cité developed as a block infill and coexisted with other building types or uses at the scale of the block. In addition to this, another argument that explains the success of the Cité is the combination between greening, intimacy, and scale of open spaces. As is clear in the Cité Adriana Cousiño, its success is mainly given by the possibility to establish visual control (virtual ownership) over communal areas, which, due to their small size, had low maintenance costs and therefore be paid by neighbours (Fig. 51, 52, 53). However, despite its large success and proliferation during 3 decades, the Cité ceased in the 1940s because of its inability to incorporate car parking and the progressive urban consolidation of the city centre that significantly reduced the availability of plots.

Based on the design considerations of the Cité,

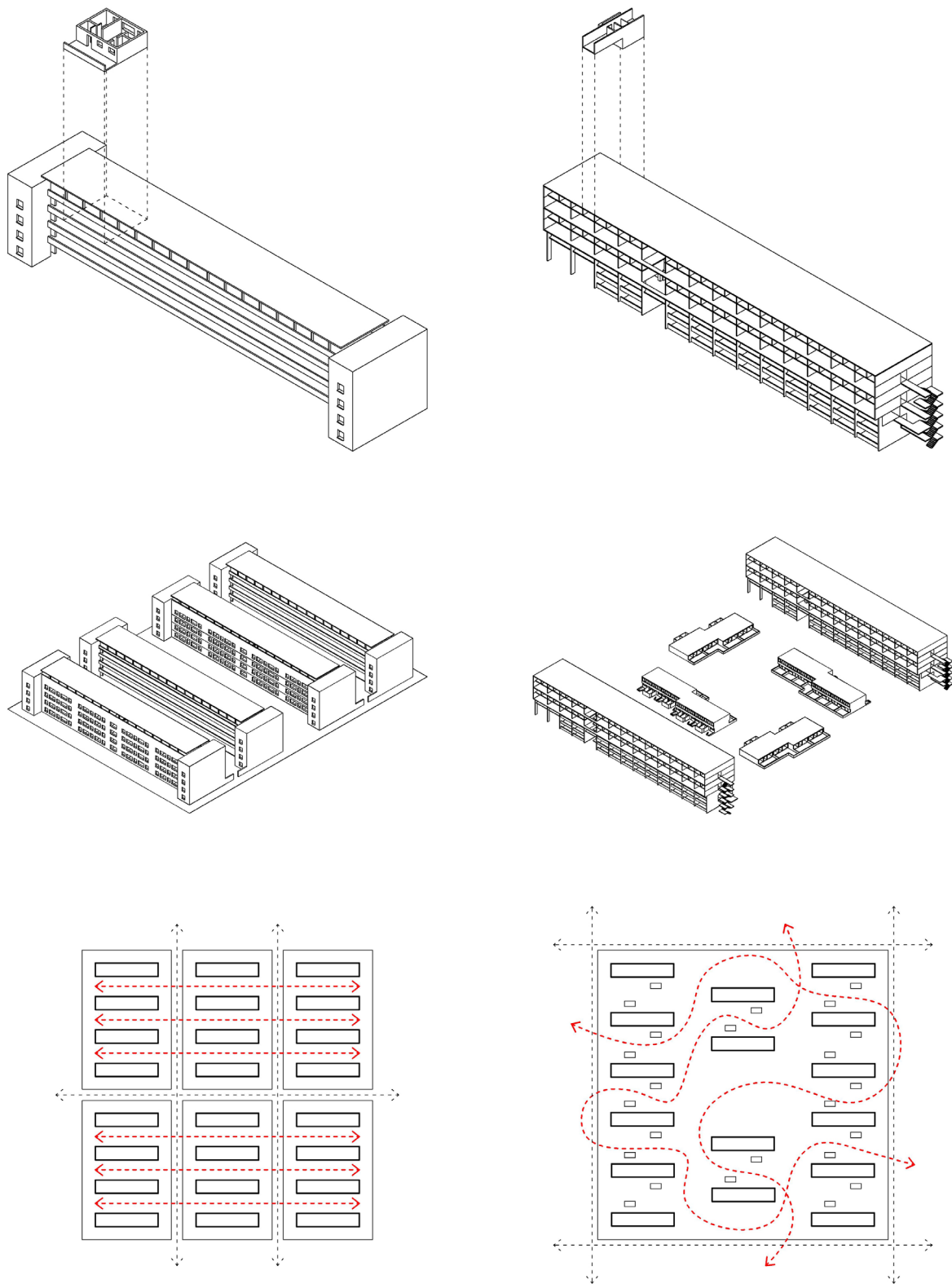


Fig. 54 - 55 (from left to right)
Mid-high density housing types and systems of urban proliferation from 1940 to 1960.

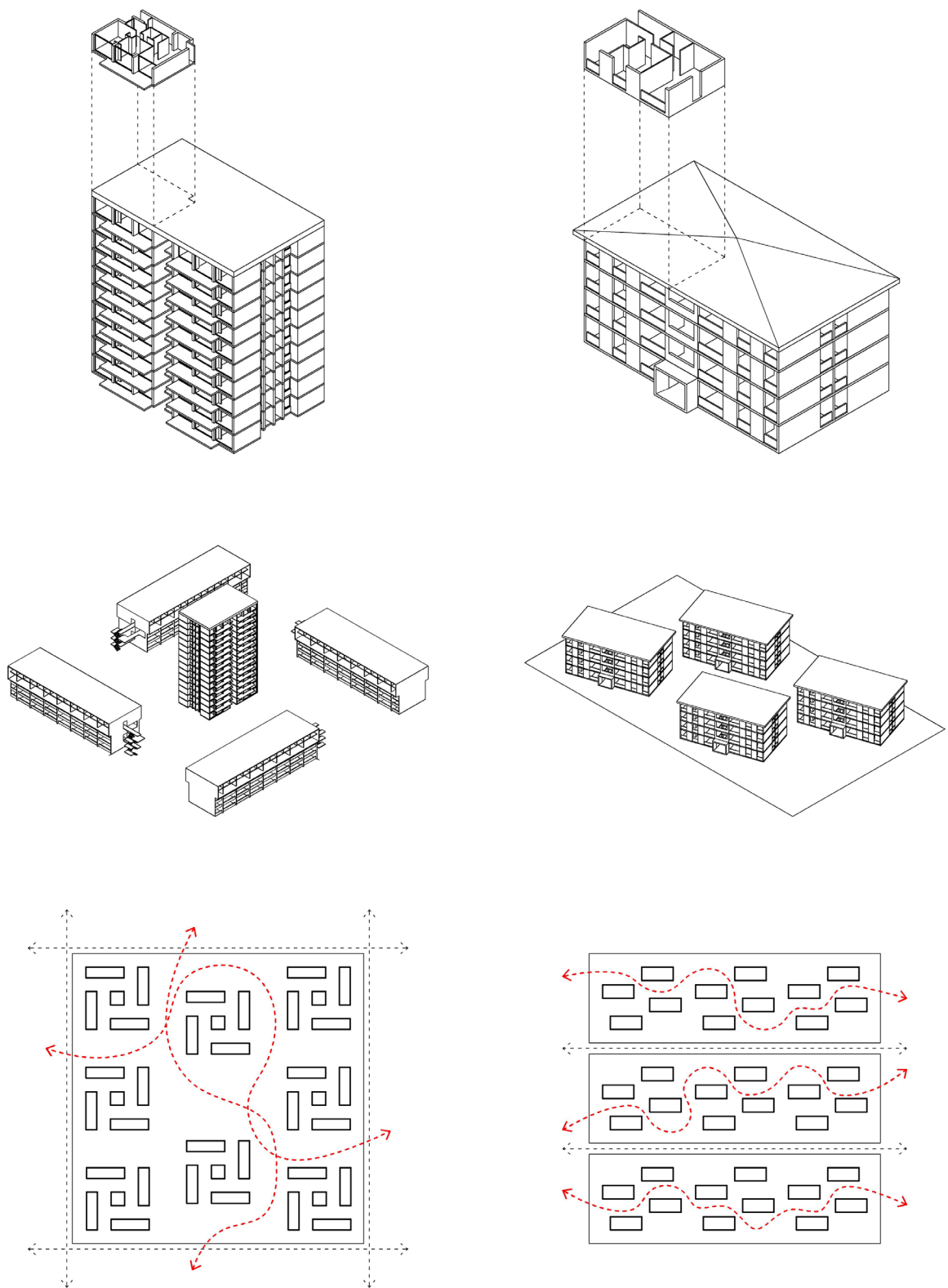


Fig. 56 - 57 (from left to right)
High density housing types and systems of urban proliferation from 1960 to 1973.

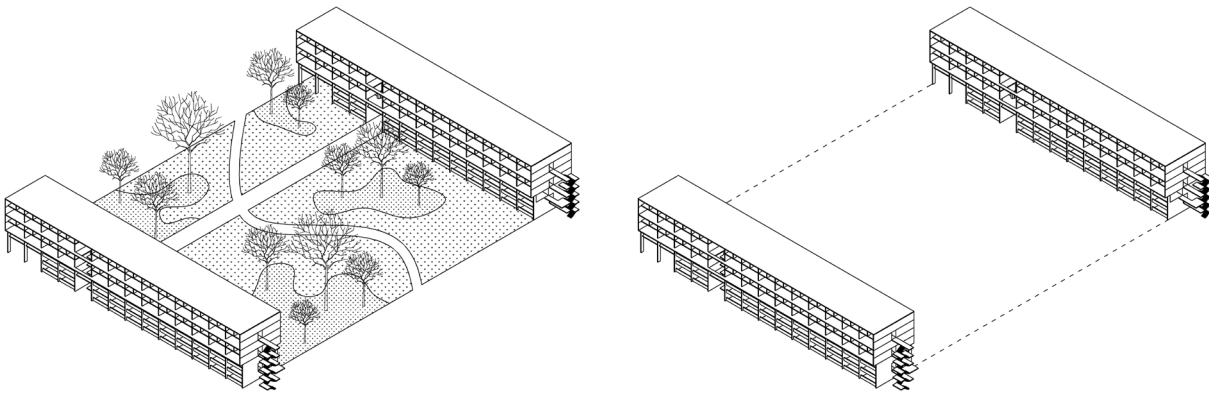


Figure 58
Diagram of the current abandonment of communal areas in high-density housing.



Fig. 59
Typical urban outcome of high-density housing. Photo by Plataforma Arquitectura.

the problem of Elemental is not understanding the row house as a means to install principles of urban design through the strategic use of the ground but as excluding other housing types. One important argument against this low-rise solution is the need to produce increased housing density, for which the inclusion of mid-rise and high-rise building types is required. This was in fact another reason for abandoning the *Cité* in the 1940s. Specifically, this was changed by the slab block and tower block, whose combination led to a range of high-density urban models between 1950 and 1973 (Fig. 54, 55, 56, 57). Even though these allowed for much higher densities and large leisure and communal areas at

the ground level, most of these spaces failed due to lacking long-term funding and maintenance (Fig. 58, 59).²⁵ In addition, high-rise buildings require lifts. These have high maintenance costs, which cannot be paid for by dwellers belonging to low-income groups. This is the reason why high-rise developments are exclusively built for mid and high-income housing.

Current high-rise developments are, however,

²⁵ The different forms of state funding to high-density housing developments were removed in the 1980s, transferring this responsibility to privates.

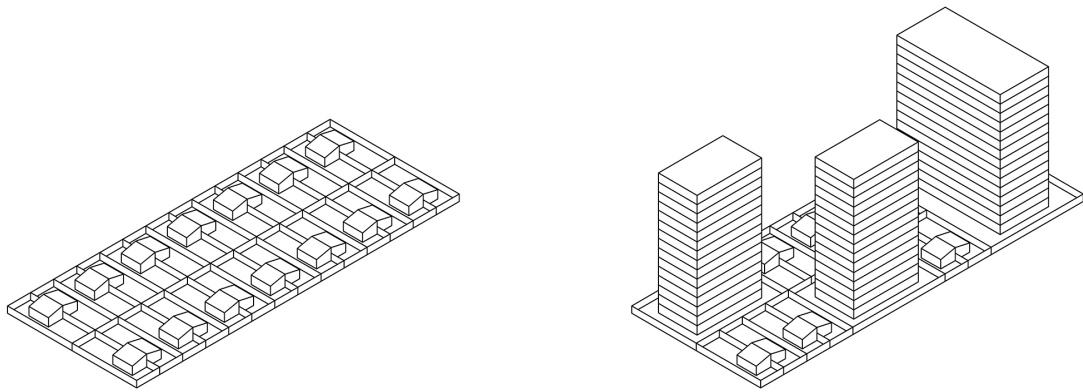


Figure 60
Diagram of the current densification process in small blocks.

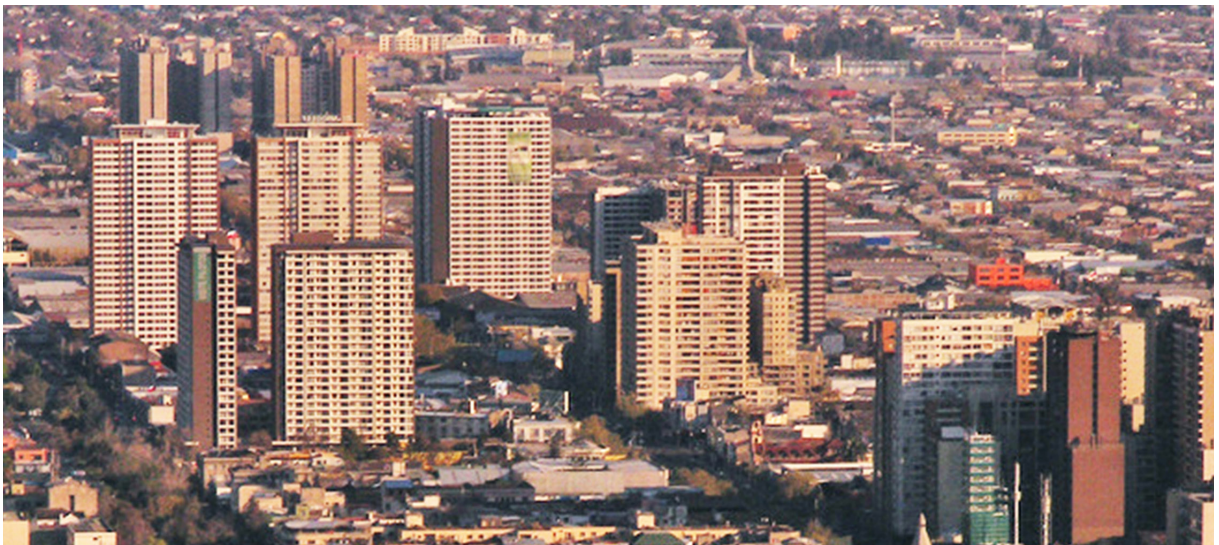


Fig. 61
Image of a typical developing area next to the city centre. Photo by Plataforma Arquitectura.

different from the ones so far discussed. Most of them emerged as an answer to densify existing blocks, by a significant amount, the outcome of the *Basic Dwelling Programme* (using semi-detached houses) and *Progressive Housing Programme* (based on row houses) (Fig. 60). The problem of this densification process is that existing planning regulations define high-rise buildings in the same way as detached houses – arranged at the centre of the plot and surrounded by fences or walls – impeding any activity in the block boundaries. High-rises are normed in such a way that they cannot establish any relationship with their context or other building types, showing a total disregard for the creation of larger building

arrangements, which is ultimately a lack of concern for urban design (Fig. 61).

Typo-Morphological Agreements

If dense housing solutions are critical to both making housing affordable and to use urban land efficiently, it is necessary to produce an agreement between different building and block types. This means overcoming the existing stigmatization of housing types – enforced by the diagram proposed by Elemental – and producing a new spatial and

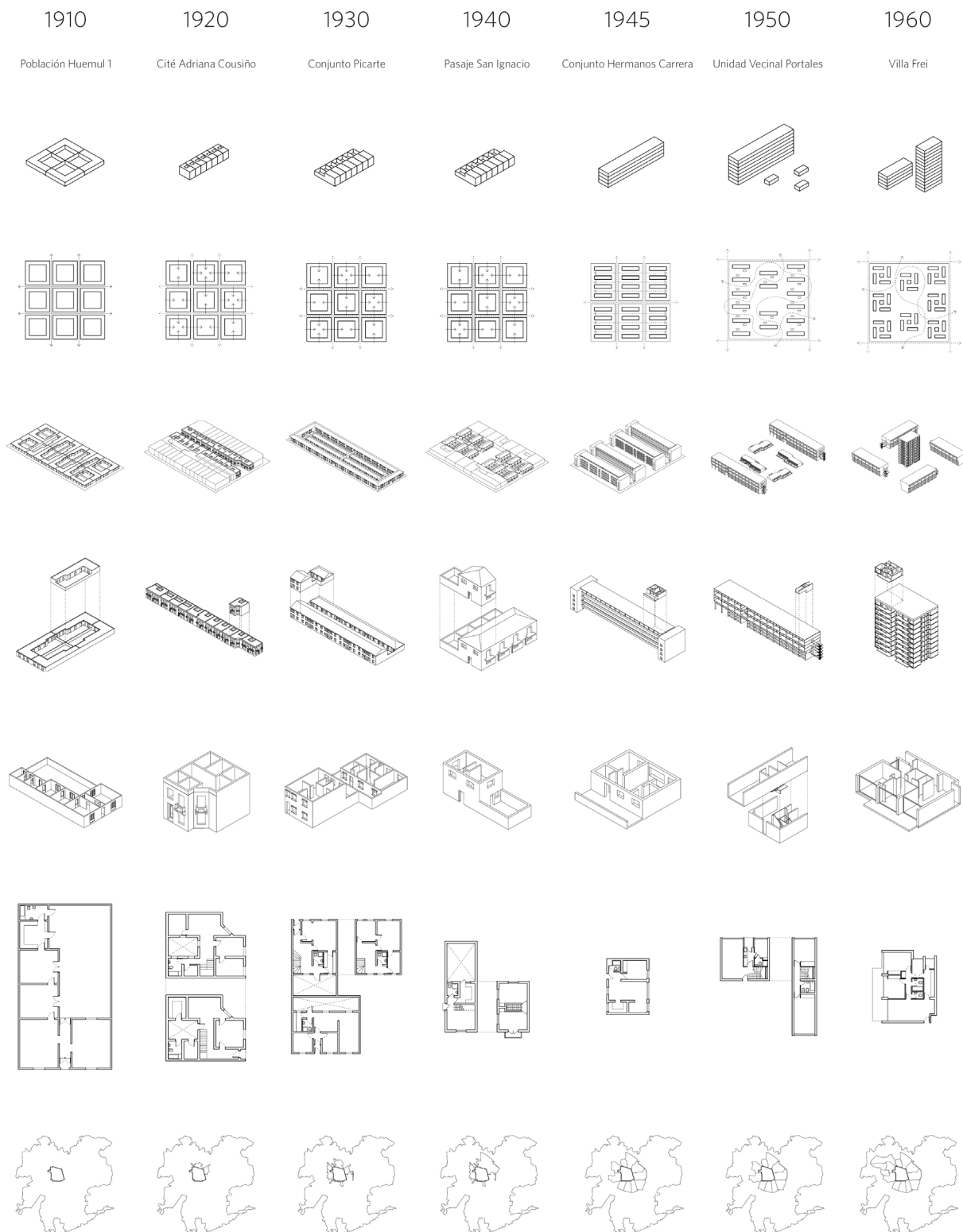


Fig. 62
Timeline of main housing types between 1910 and 2015.

1970

1980

1990

1992

1995

2005

2015

Bloques Sociales

Vivienda Semi Pareada

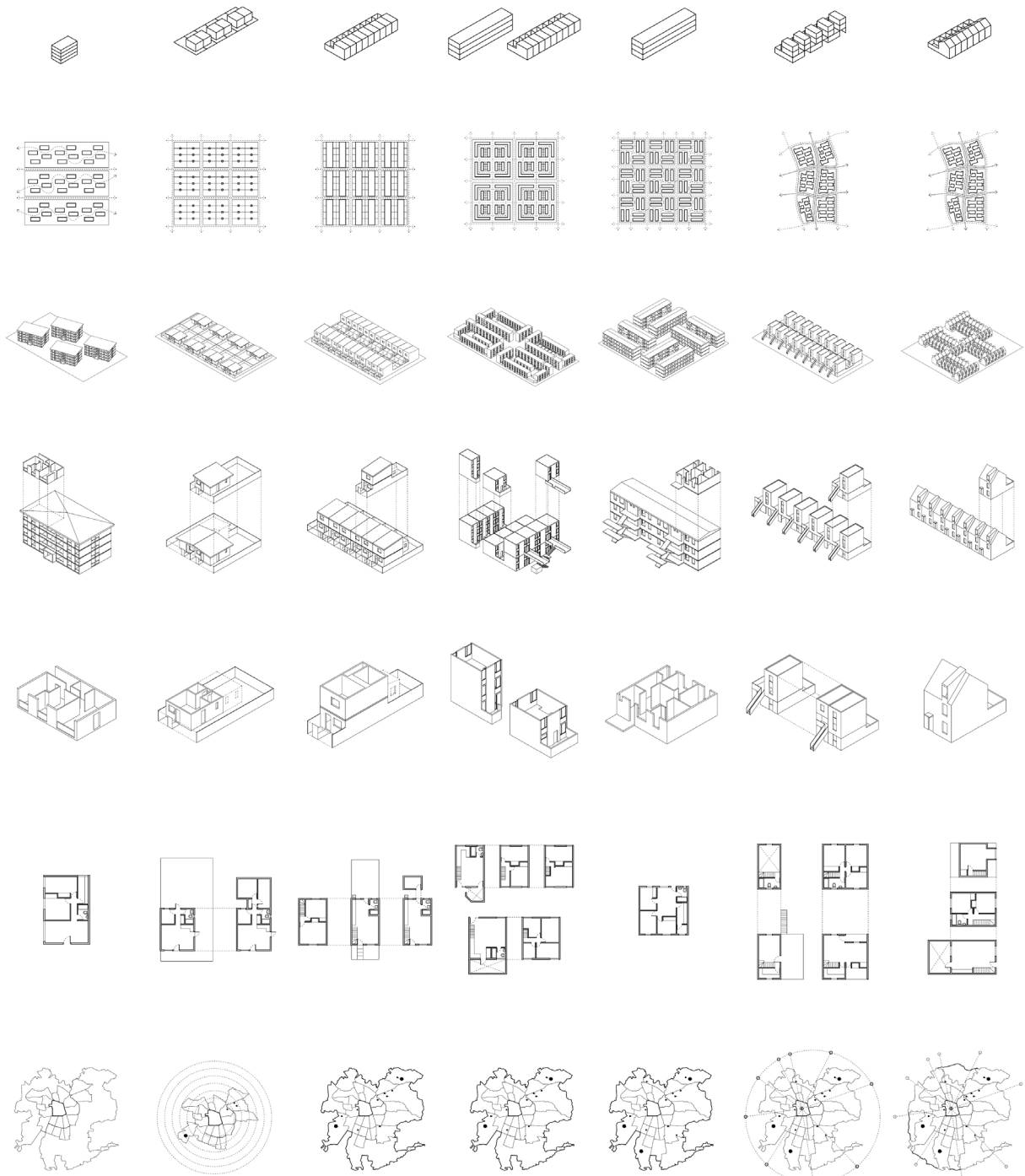
Vivienda Pareada

Comunidad Andalućia

Bloques Tijera

Elemental

Elemental Lo Barnechea



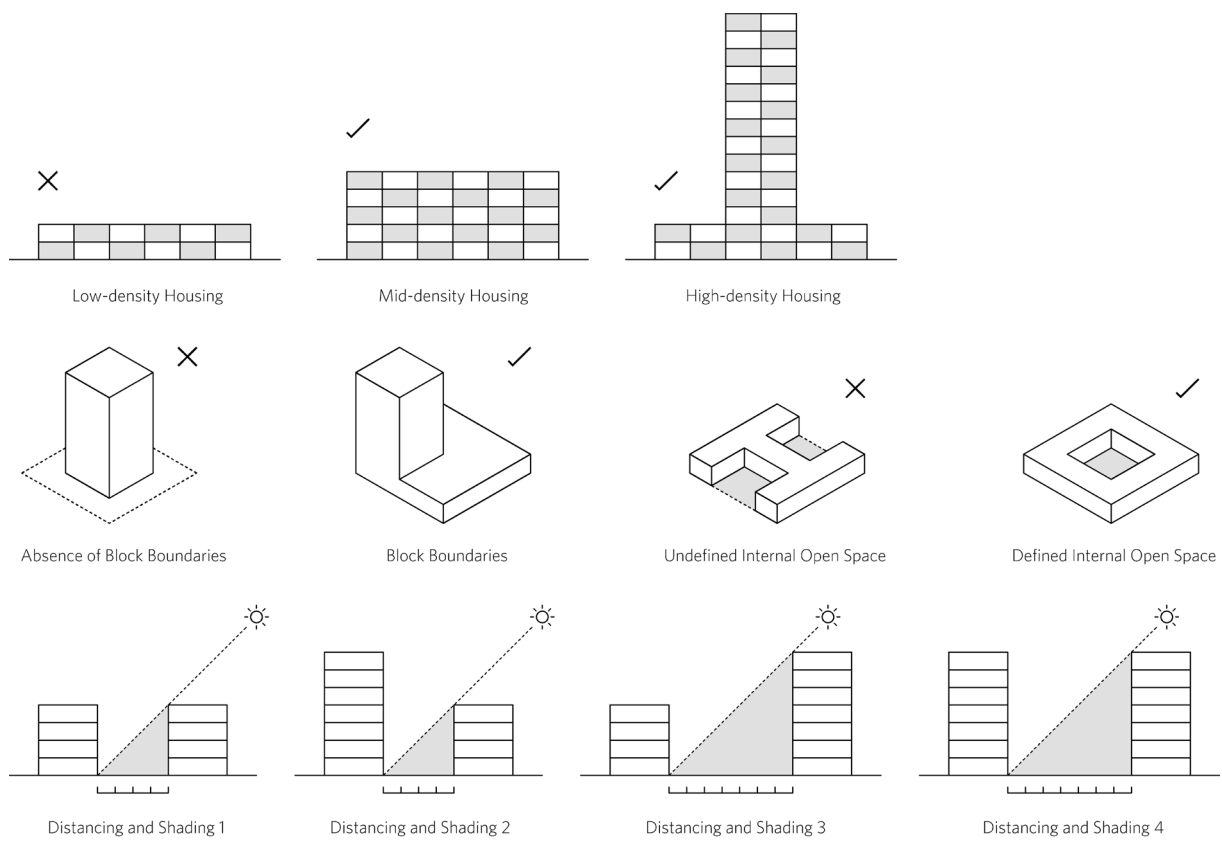


Fig. 63 - 64 - 65
Proposed criteria for density levels, block boundaries, internal open spaces, and sun access.

	Tower	Row House	Slab Block	Slab Block + Tower	Row House + Tower	Slab Block + Tower
Perimeter Arrangement						
Centralized Arrangement						
Mixed Arrangement						

Fig. 66
Proposed matrix of building arrangements.

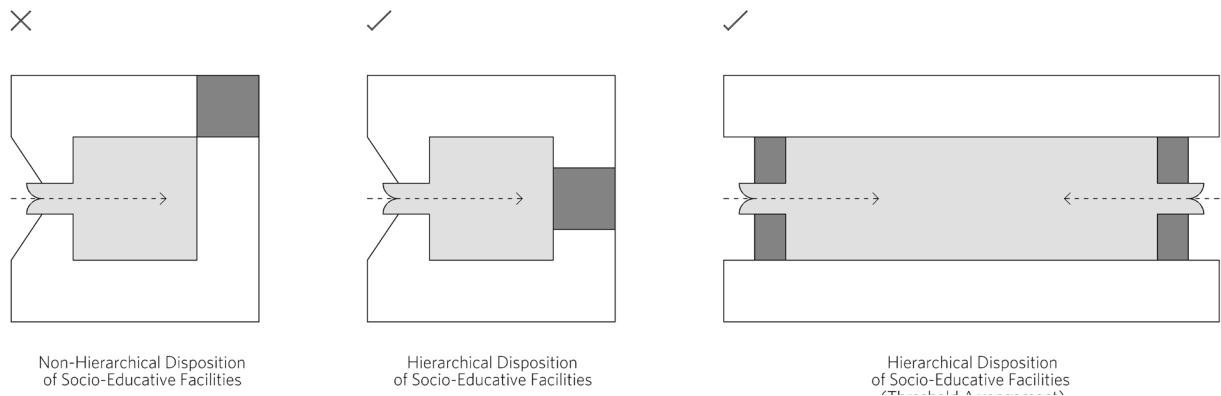


Fig. 67
Disposition of socio-educative facilities in relation to the communal open space.

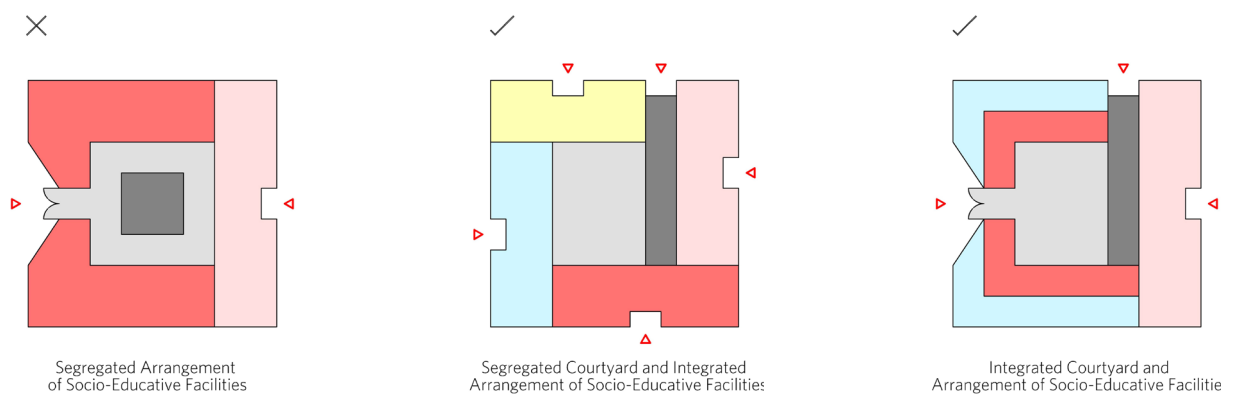


Fig. 68
Arrangement of different functions-uses and accesses.

functional syntax capable of reconsidering the potential of abandoned housing types (Fig. 62). This should not only strategically put together different forms of housing, but also include other programmes and functions in order to create a spatial proximity between housing and infrastructure. Also, the housing solutions should respond to basic criteria for building design, which should include high-density levels, access to natural light, built perimeter, and the provision of clearly defined internal open spaces (Fig. 63, 64, 65). In doing so, it is possible to first propose a matrix of housing arrangements (Fig. 66). This provides a range of typological assemblies composed of row houses, slab blocks and tower blocks, which can respond to the specific needs of each project and its context. In addition to this, the housing arrangements should consider the provision of socio-educative

infrastructures, whose role is complementing the minimum dwelling programme – as explained in the previous chapter. This infrastructure is not just another criteria to include but has to be disposed in such a way that establishes a hierarchical visual and physical relationship with the main communal open space (Fig. 67). The implementation of socio-educative infrastructures should be thought in parallel to a strategy capable of providing clear spatial-administrative limits to each building compound, thus avoiding issues of ownership, maintenance, privacy, and security. Responding effectively to these is largely determined by the provision of physical (architectural) boundaries and independent accesses from the street (Fig. 68).

The proposed assemblies are to be applied at


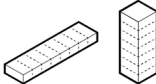
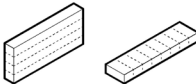

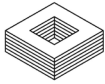
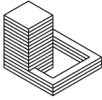
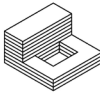

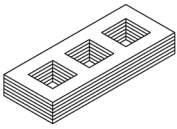
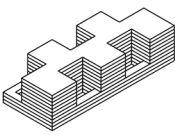
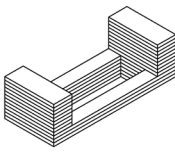

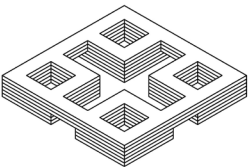
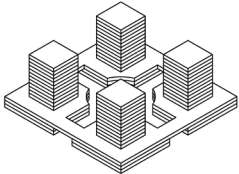
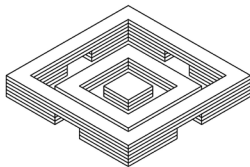

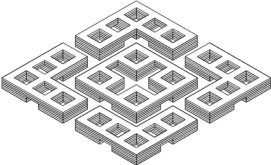
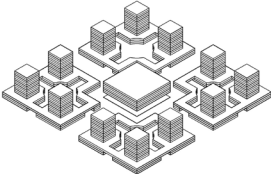
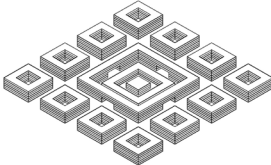
	 <p>Slab Block</p>	 <p>Row House + Tower</p>	 <p>Slab Block + Row House</p>
 <p>Small Block 40x40 meters</p>	 <p>Average Density 1700 p/ha</p>	 <p>Average Density 1700 p/ha</p>	 <p>Average Density 1700 p/ha</p>
 <p>Linear Block 40x100 meters</p>	 <p>Average Density 1500 p/ha</p>	 <p>Average Density 2000 p/ha</p>	 <p>Average Density 1600 p/ha</p>
 <p>Medium Block 100x100 meters</p>	 <p>Average Density 1300 p/ha</p>	 <p>Average Density 1800 p/ha</p>	 <p>Average Density 1300 p/ha</p>
 <p>Large Block 200x200 meters</p>	 <p>Average Density 1300 p/ha</p>	 <p>Average Density 1400 p/ha</p>	 <p>Average Density 1200 p/ha</p>

Fig. 69
Matrix of block arrangements according to different block sizes and combination of building types.

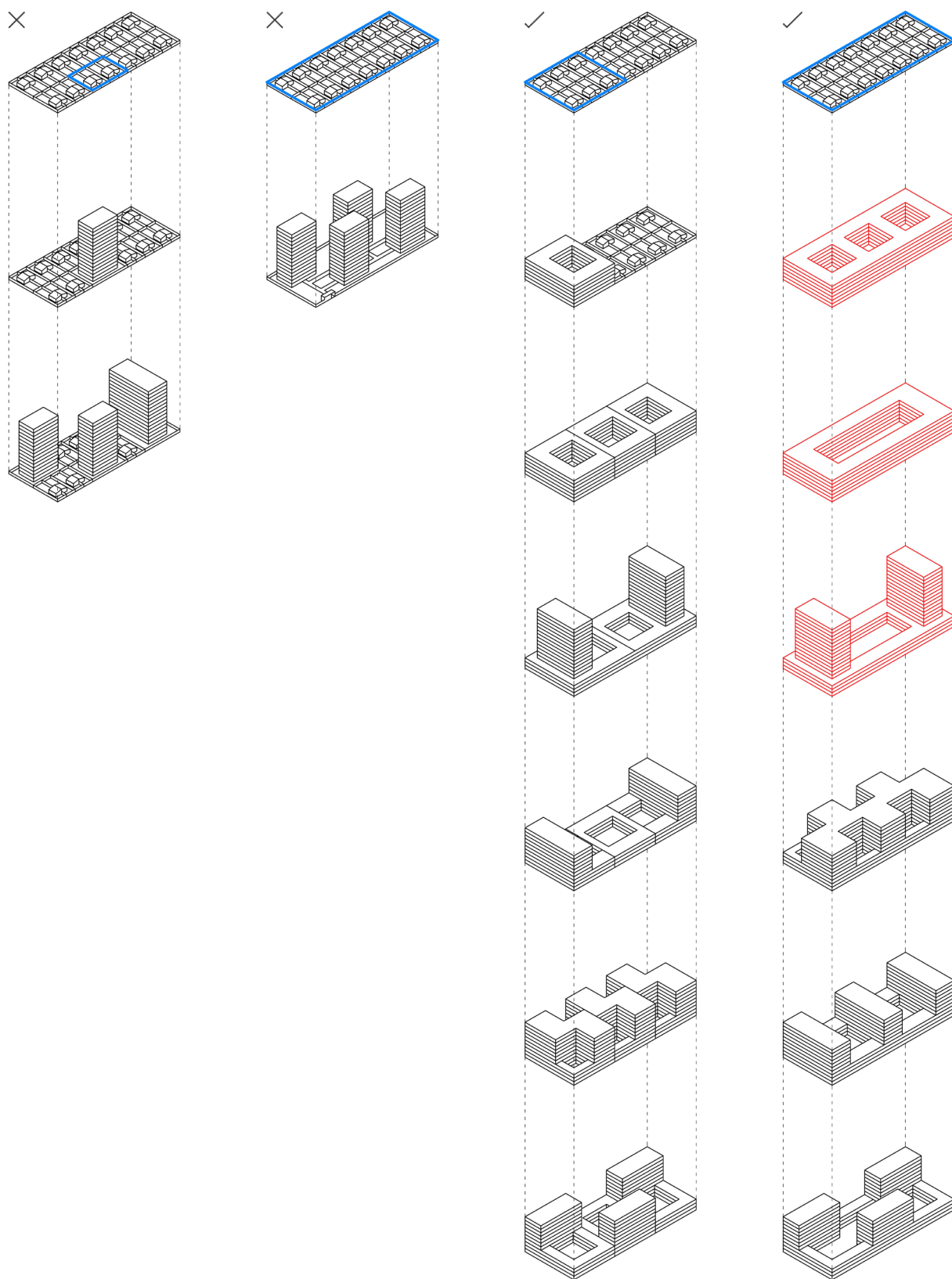


Fig. 70
Different arrangements for the development of a 40x100 meters block in fragments and as an entire unit.

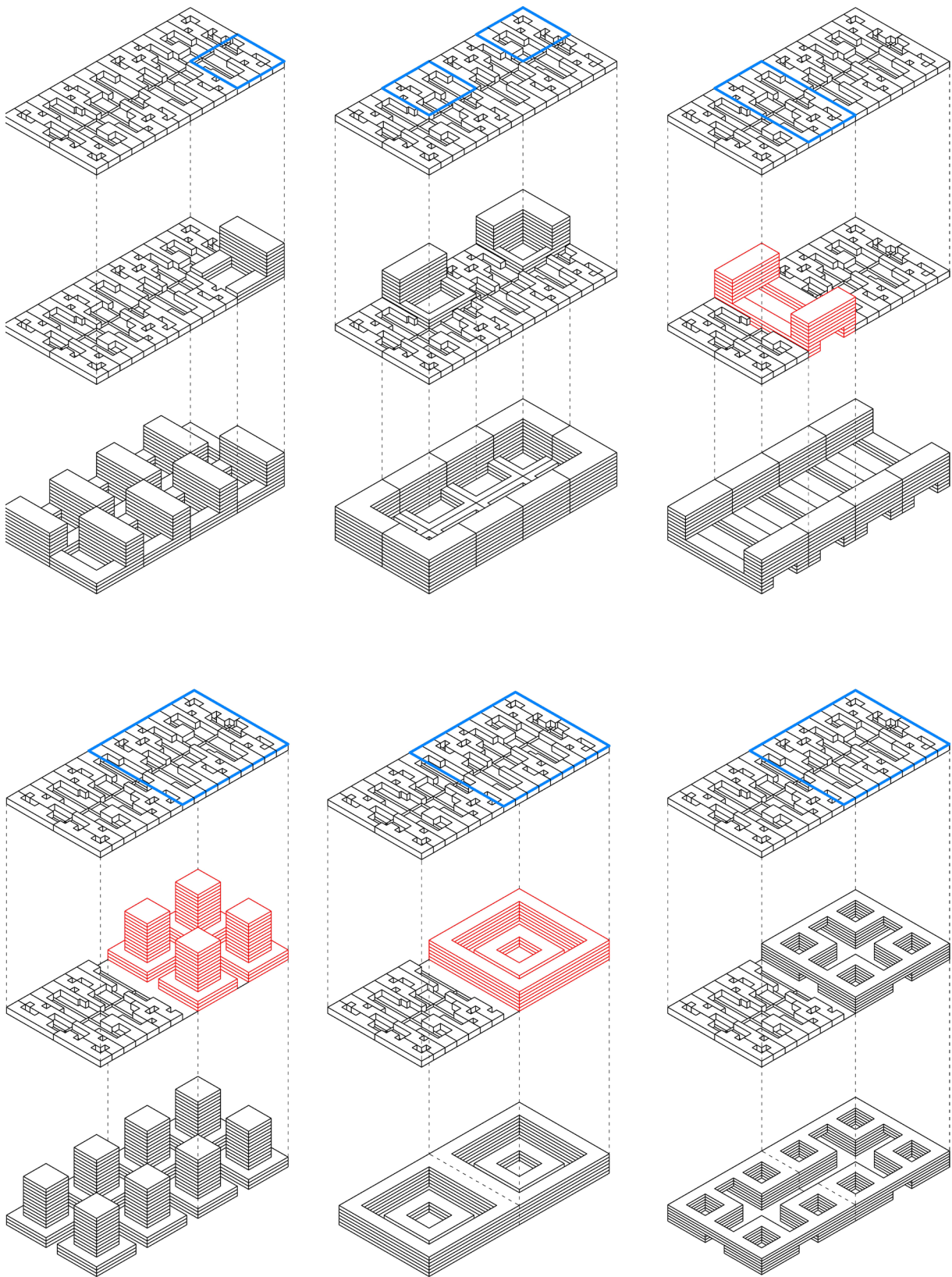


Fig. 71
Different arrangements for the development of a 80x160 meters block in small and large fragments.

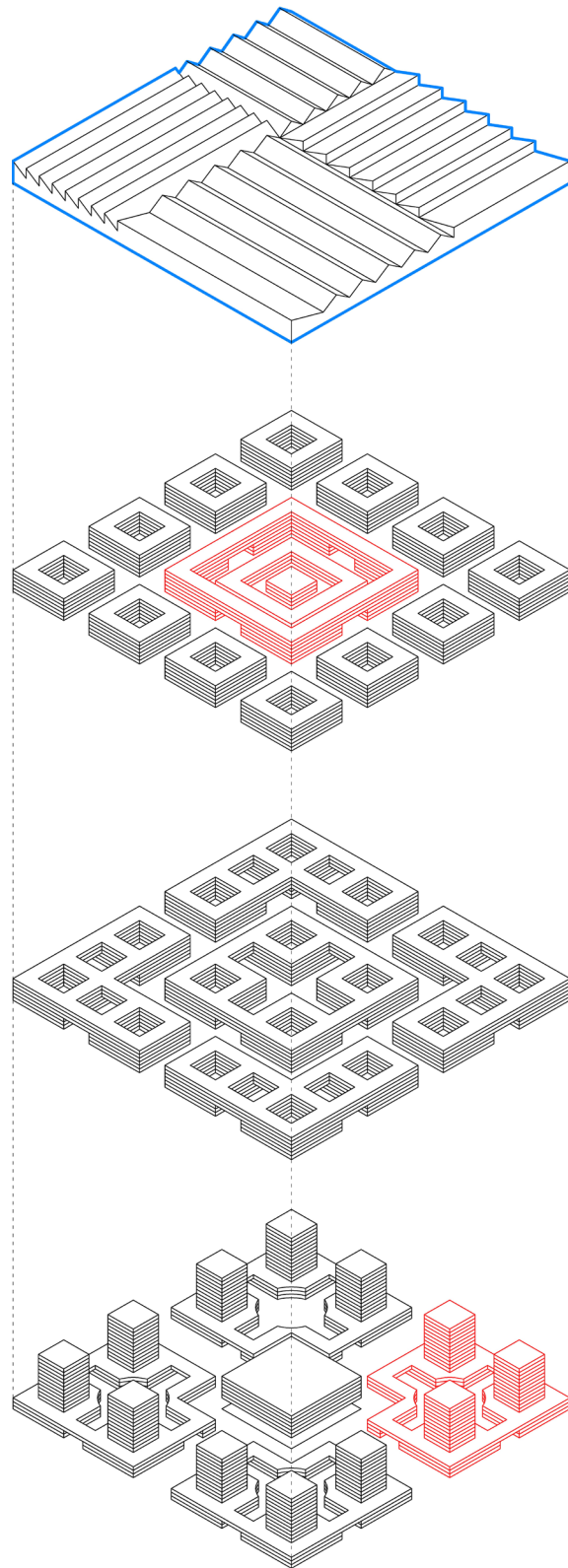
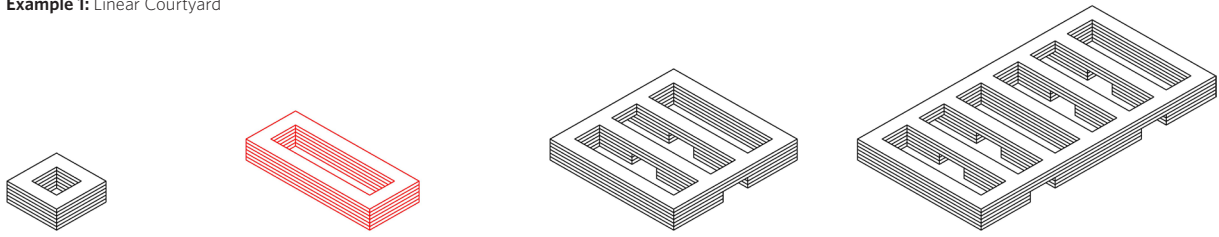
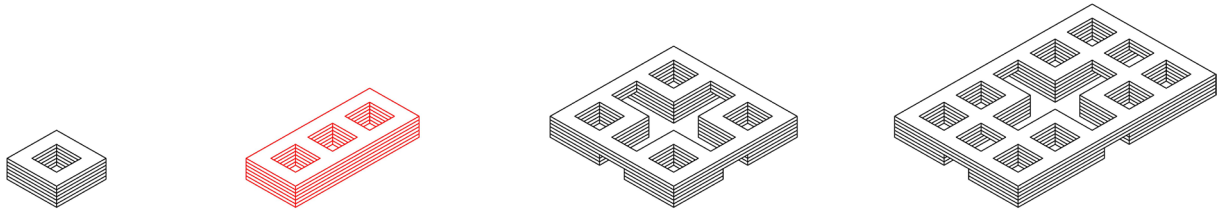


Fig. 72
Different arrangements for the development of a 200x200 meters block.

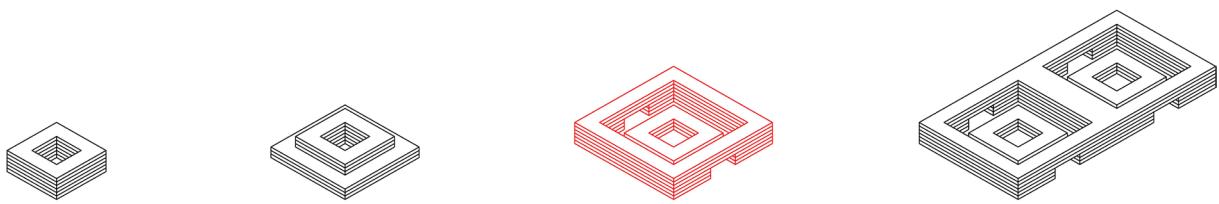
Example 1: Linear Courtyard



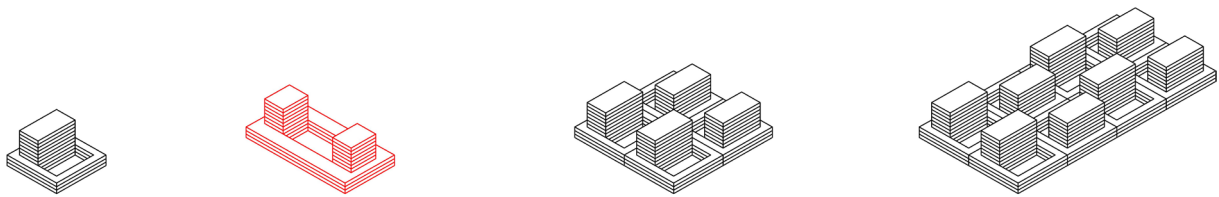
Example 2: Multi-Courtyard Housing Block



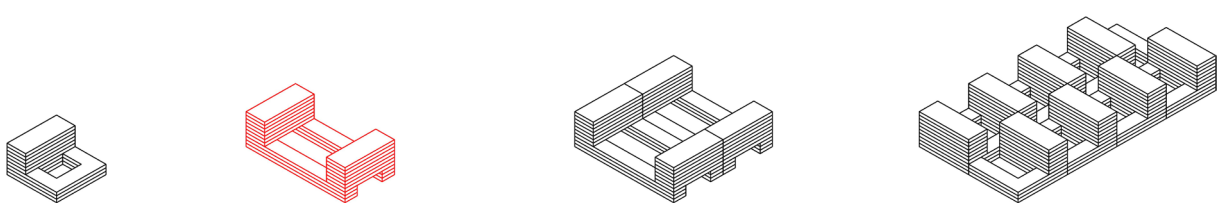
Example 3: Inner Block Circuit



Example 4: High-Rise Courtyard Block



Example 5: Inner Block Street



Example 6: Inner Block Grid

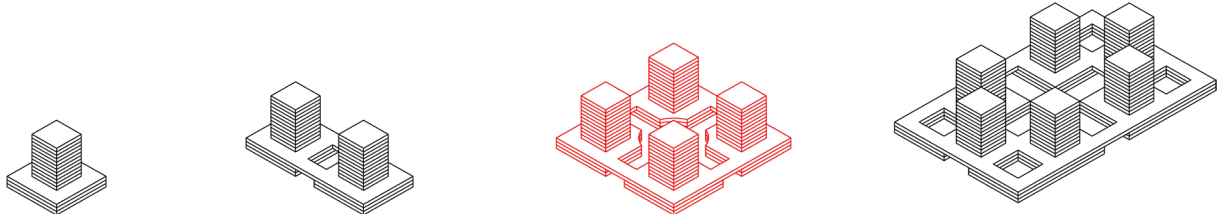


Fig. 73
Proliferation potential of the different examples from small to large arrangements.

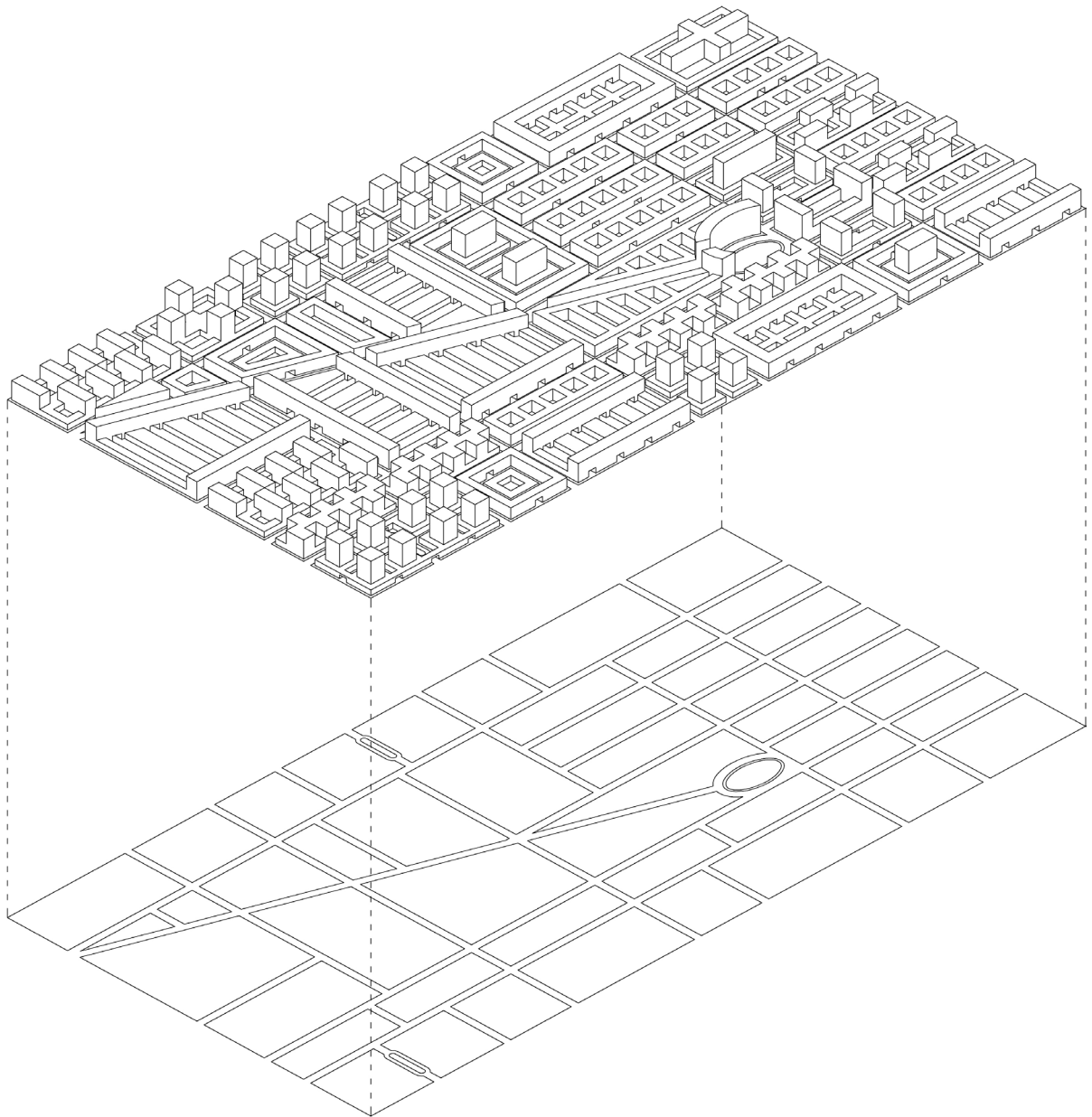


Figure 74
Axonometric of the range of block typologies applied according to the different plot sizes and morphologies.

the block scale. They are not isolated solutions but design elements allowing for spatial and functional compatibilities in order to produce larger arrangements. Thus, small components determine the system of general assemblage, which means that the building and block scales are interrelated. Following this idea, it is possible to propose a second matrix now at the block scale (Fig. 69). Apart from combining different building types, the matrix also considers a range of block sizes, consisting of small,

linear, medium, and large blocks.

The different building assemblies can be then tested according to specific block dimensions. The first is a block of 40x100 meters, a typical size for the semi-detached and row-house areas developed since the 1980s (Fig. 70). Although the block length tends to vary, the width is shared by a significant number of mono-programmatic housing blocks in central areas of the city. One possibility then is to apply the

proposed typological assemblies in block segments. This would allow for the inclusion of small housing agents in the design process, which could complete the block's densification process. On the other hand, the block can be designed as a complete unit. This requires larger efforts by private agents, or it can be a state-driven housing development.

The following block size is a mid-sized one. For example, one of 80x160 meters, which is typical for housing developments during the first half of the twentieth century (Fig. 71). As in the first examples, the block can be conceived in parts or as a whole. However, due to its scale, it is more likely that the block is made up of smaller units. One of the differences of dealing with large blocks is the issue of the interior. To address this issue adequately, strategies such as those found in the *Cité* can be used. This means making use of the block interior through a combination of streets and row houses, introducing green spaces and communal areas.

Apart from the 80x160 meters block, it is also possible to address one of a large-size, as is the case of a block of 200x200 meters (Fig. 72). Although this block can be made of nothing more than housing, its large dimension allows to include mid-scale infrastructures. Thus, a proliferation of smaller housing blocks at the perimeter is proposed, which allows to access the block interior.

The sum of block assemblies are not understood as unique solutions but in relation to an organizational structure that can produce similar arrangements in blocks of different sizes (Fig. 73). This means that apart from being determined by a strategic combination of building types, each block arrangement produces a specific urban fabric and therefore a system of urban proliferation. Thus, they embody a logic for not only producing buildings of different sizes but also, and more importantly, for urban design. Following this idea, it is possible to test randomly the ability of the different block solutions to respond to an undeveloped residential area – determined by blocks of different geometries and sizes – located in the central district of San Miguel (Fig. 74). This exercise does not consider the phasing of block arrangements nor pretends to become a masterplan. Rather, it is a

demonstration of the versatility of the proposed block solutions.

CONCLUSION

The Block as an Expanded Social and Urban Field

Collective living is essentially an urban problem and therefore cannot be understood through a number of autonomous functions in isolated buildings. To the contrary, it requires a common urban design framework capable of bringing them together in a comprehensive manner. In relation to this problem, the block plays a fundamental role in both producing spatial and functional proximities between housing and its associated functions and linking private and public spheres. The latter is of special importance when social concerns are introduced at this scale. The main reason for this is that the block is an important means to create urban spaces not only on the outside but inside, becoming a transitional milieu where intimate social manifestations can be deployed. If these manifestations are conceived, as Latour suggests, under the idea of the social as the outcome of a network of relationships between elements of different natures, what is proposed here is that the importance of the block lies in its ability to assemble a domestic environment made of physical and social functions.

But the block as an assembled environment has been barely considered by housing design guides, focusing instead on defining a range of dimensional, morphological, and visual considerations that refer to themselves. If the problem is understood conversely, design guides are at risk of prescribing fixed assemblies as prototypical block solutions to be reproduced indiscriminately throughout the city. Instead of choosing between these two biased approaches, it is proposed that the focus be on the compatibility among different design elements in order to produce multiple building and block arrangements. Such compatibility is highly determined by the rethinking of the row house. Despite being an insufficiently dense and mono-programmatic housing solution, the row house deals successfully with maintenance and ownership problems at the ground level, which is seen as an opportunity to create new social domains by bringing different forms of urban fabric at the interior

of the block. Based on this idea, the ground should not be limited to functional problems of circulation and differentiation of accesses but can address other kinds of problems. The ground can also be seen as a strategic means to organize different uses and infrastructures at the interior and exterior of the block. Especially socio-educative facilities, through which a specific order to building and block arrangements can be provided. In relation to this infrastructure, the ground should be understood by design guides as a fundamental design criteria due to its ability to become an expansion of socio-educative spaces, bringing a 'decompressed' dwelling programme – as argued in the previous chapter – and the urban sphere in a hybrid and interconnected domestic environment together. From this idea, it can be stated that the ground and the block interior are the beginning of a process of socio-spatial constructions and infrastructural continuity – given by the proliferation of block arrangements – that can define larger scales, such as the one of the neighbourhood.

Besides the above, creating building agreements allows to not only produce a number of dense block assemblies but also bring together different forms of housing and thus respond to an important right to housing and the city. The deployment of these agreements is demonstrated in the design examples by adapting to multiple contexts with different block sizes through a number of street and courtyard arrangements – producing new interior and exterior urban qualities and therefore new social spaces – which shows the versatility of the criteria provided for building and block design.

NEIGHBOURHOOD



Urban Design Tools

In recent years, urban design has been understood as a discipline mainly concerned with the creation of policies and rules, which should be abstract enough to provide freedom of design and possibility of adaptation to different contexts. This way, diagrams and systems of architectural representation such as plans, sections, elevations, three-dimensional drawings, and perspectives are seen as unsuitable as they are overly specific. In other words, traditional design tools play a secondary role in urban design. As Alex Lehnerer states 'the enterprise of urban design – that is to say, the linking together of various design visions via the negotiation of a diversity of private and public interests – consists more of the conscious positing of rules than the drawing up of plans'.¹

Dismissing tools of architectural and urban design, however, is problematic when looking at contemporary housing design guides. Particularly, by recognising the current difficulty to define the neighbourhood scale as such: a primary urban unit that plays an essential role in the provision of social welfare through the organization of housing and mid-scale infrastructure. Ignoring this, current housing design guides have become a compendium of highly abstract criteria mainly transmitted through text. This is clear in recent documents such as the *London Housing Design Guide* (2010). Here, the neighbourhood or any other spatial arrangement of housing and mid-scale infrastructure are ignored and instead replaced by the abstract and subjective concept of 'shaping good places'. The ambiguity of how to deal with problems of urban design becomes explicit when the Mayor of London introduces the guide claiming:

In building London's future we reflect on a past that has created some of the best buildings and urban spaces to be found

anywhere in the world [...] If we are to renew the capital's tradition of design excellence, we must understand the thinking behind the city's design achievements and its failures.²

The guide avoids to include any visual material at the urban scale. Instead, it provides written recommendations based, firstly, on issues of character and context. These ask for replicating London's traditional scale, materials, massing, and building types. Secondly, the guide calls for a necessary connectivity with the network of open spaces. These are made up of streets, squares, parks, gardens, mews, lanes, pedestrian paths, and cycling routes. The only set requirement for open spaces is the provision of playing facilities, which vary in size according to the number of children (Fig. 1). In addition to this requirement, the guide also defines ideal densities for suburban, urban, and central areas, which should have an 'appropriate' mix of housing types (Fig. 2).

By relying only on a written document, the urban domain is determined by subjective design considerations and planning policies devoid of spatial and functional contents for the provision of housing and mid-scale infrastructures. Such a challenge means that design criteria at the neighbourhood scale cannot rely entirely on abstract numerical and disconnected considerations. Rather, it requires a complementary and more tangible approach to produce specific infrastructural assemblies that can enable urban processes within neighbourhoods.

¹ Alex Lehnerer, *Grand Urban Rules* (Rotterdam: 010 Publishers, 2009) p. 58.

² Mayor of London, *London Housing Design Guide* (London: Palestra, 2010), p. 4.

No. of children	10 – 29	30 – 49	50 – 79	80+
Size of space required	100-300 sq m	300-500 sq m	500 – 800 sq m	800 sq m +
Facilities for under 5s	On-site doorstep playable space	On site local playable space	On-site local playable space	On-site local or neighbourhood playable space
Facilities for 5-11s	Off-site within 400m			
Facilities for 12+	Off-site within 800m	Off-site within 800m	Off-site within 800m or on-site subject to size and local circumstances	On-site youth space
Possible variation to reflect existing provision	If area is deficient in play space for 5–11s, some on-site facilities should be provided	If area is within 400m of existing facilities for 5–11s, an off-site contribution may be considered if in accordance with Play Strategy	If area is deficient in spaces for 12+, some on-site facilities or new off-site provision should be provided within 800m	If area is within 800m of existing facilities for 12+, an off-site contribution may be considered if in accordance with Play Strategy

Fig. 1
Table of requirements for supplementary planning (SPG). From London Housing Design Guide (2010).

Setting	Public Transport Accessibility Level (PTAL)		
	0 to 1	2 to 3	4 to 6
Suburban	150–200 hr/ha	150–250 hr/ha	200–350 hr/ha
3.8–4.6 hr/unit	35–55 u/ha	35–65 u/ha	45–90 u/ha
3.1–3.7 hr/unit	40–65 u/ha	40–80 u/ha	55–115 u/ha
2.7–3.0 hr/unit	50–75 u/ha	50–95 u/ha	70–130 u/ha
Urban	150–250 hr/ha	200–450 hr/ha	200–700 hr/ha
3.8 –4.6 hr/unit	35–65 u/ha	45–120 u/ha	45–185 u/ha
3.1–3.7 hr/unit	40–80 u/ha	55–145 u/ha	55–225 u/ha
2.7–3.0 hr/unit	50–95 u/ha	70–170 u/ha	70–260 u/ha
Central	150–300 hr/ha	300–650 hr/ha	650–1100 hr/ha
3.8–4.6 hr/unit	35–80 u/ha	65–170 u/ha	140–290 u/ha
3.1–3.7 hr/unit	40–100 u/ha	80–210 u/ha	175–355 u/ha
2.7–3.0 hr/unit	50–110 u/hr	100–240 u/ha	215–405 u/ha

Fig. 2
London plan density matrix (habitable rooms and dwellings per hectare). From London Housing Design Guide (2010).

Form versus Diagram

Unlike current examples of design guides, providing directions of practice at the neighbourhood scale was clearly recognized as a problem to address in the early versions. Here, the provision of infrastructure plays a central role in housing developments, which require a wide range of public and private programmes that are essential to meet needs of everyday life. As stated in the *Housing Manual 1944* (UK):

Where big authorities must build a very large number of new houses, it may be possible to plan a new self-contained community based on a new centre of employment. In such a community due regard must be paid to industrial, social, educational, and recreational centres and their relations to the new development as well as to accommodation for the different classes of people who make up a well-balanced residential neighbourhood. The scheme must not be planned simply as a dormitory without a recognisable centre; it should include shopping facilities, schools, churches, and the other communal buildings frequented in everyday life, so as to meet practical needs and at the same time lead to a sense of neighbourliness among the families who go to live there. [...] In such a neighbourhood there should be a variety of family types differing in experience and outlook as well as in size. It is large enough to require and support a fairly complete range of communal facilities and yet small enough to bring every house within easy distance of the main neighbourhood shopping and social centre. It is also a convenient unit on which to base the provision of schools.³

While the guide is highly specific in defining what infrastructural provision should be considered, when looking at the given urban examples, this is less clear. This is partly due to the impossibility to predetermine

concrete urban outcomes through written documents and tools of architectural representation, which are subject to specific material and social topographies. On the one hand, the guide includes an urban extension layout devoid of any criteria for infrastructural provision (Fig. 3). Rather, it only shows a linear arrangement of cottages that provide a formal continuity to an existing village. On the other, at the end of the document, it is possible to find 48 photographs that exemplify good architectural and urban design practices. Of these, only one refers to neighbourhood planning, showing an aerial view of a residential development around an urban centre (Fig. 4). This, however, does not say anything about the architectural or urban qualities of the neighbourhood nor the kind of infrastructure that was introduced. In fact, the photograph shows the centralized and hierarchical disposition of mid-scale buildings and green areas that organize the entire neighbourhood through a system of radial streets. The only issue that the guide explicitly requires at this scale is average density levels, which vary according to particular conditions such as countryside development, outer city town, inner city town, central areas, and central areas in large towns.

The guide's few examples of neighbourhood planning and the insufficient design criteria associated with this problem were addressed by the *Housing Manual 1949*. It clearly defines 3 urban contexts, which are: infilling of existing sporadic development, large or small extensions to existing built-up areas, and redevelopment areas (Fig. 5, 6, 7, 8). Each one is illustrated by one example of an urban layout that puts different housing types together- ranging from 2 to 8 storeys - and infrastructures such as shops, communal centres, churches, schools, nurseries, and sports clubs. Even though infrastructural provision seems to become specific by responding to the contextual conditions of each case - varying in the amount and kind of infrastructure - the proposed urban arrangements are devoid of a clear general organizational strategy.

The only logic that persists in the design examples is the rejection of street configurations in favour of the creation of quadrangles, which are disposed to create a continuity of green areas throughout the plan. The

³ Great Britain, Ministry of Health, Ministry of Works, *Housing Manual, 1944* (London: H.M.S.O, 1944), p. 11.

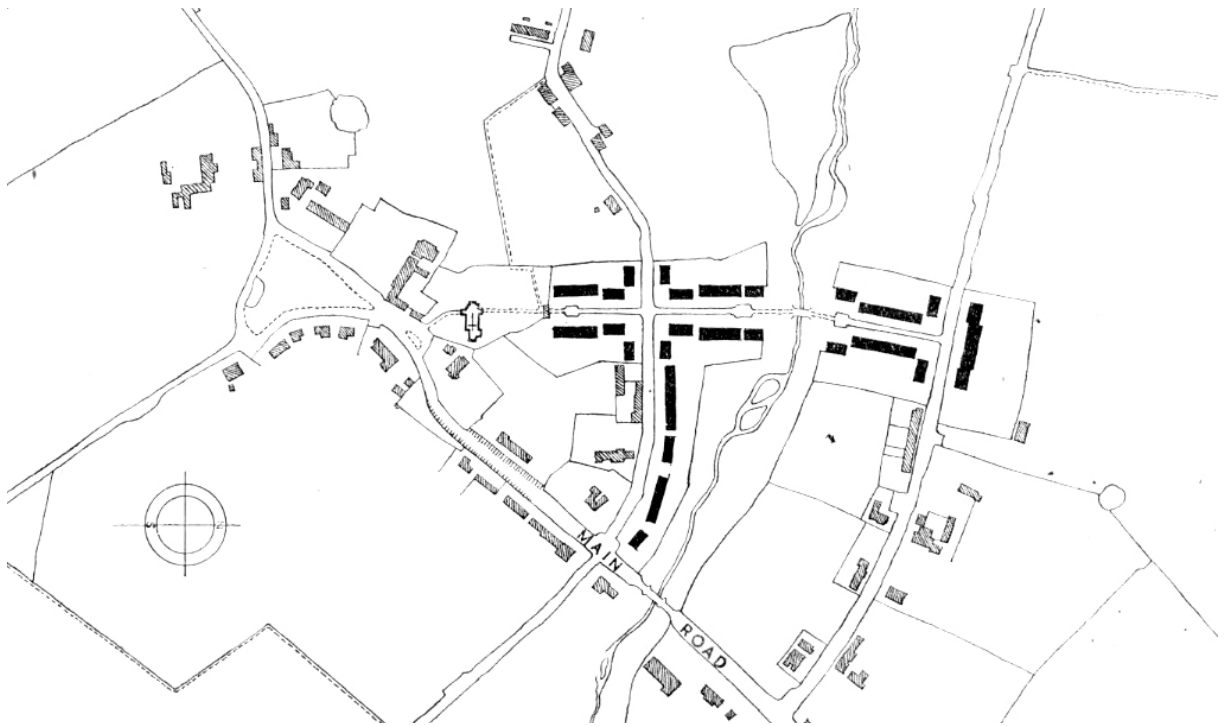


Fig. 3
Example of urban extension in a village. From Housing Manual 1944.



Fig. 4
Aerial view of Hampstead Garden Suburb as example of neighbourhood planning. From Housing Manual 1944.

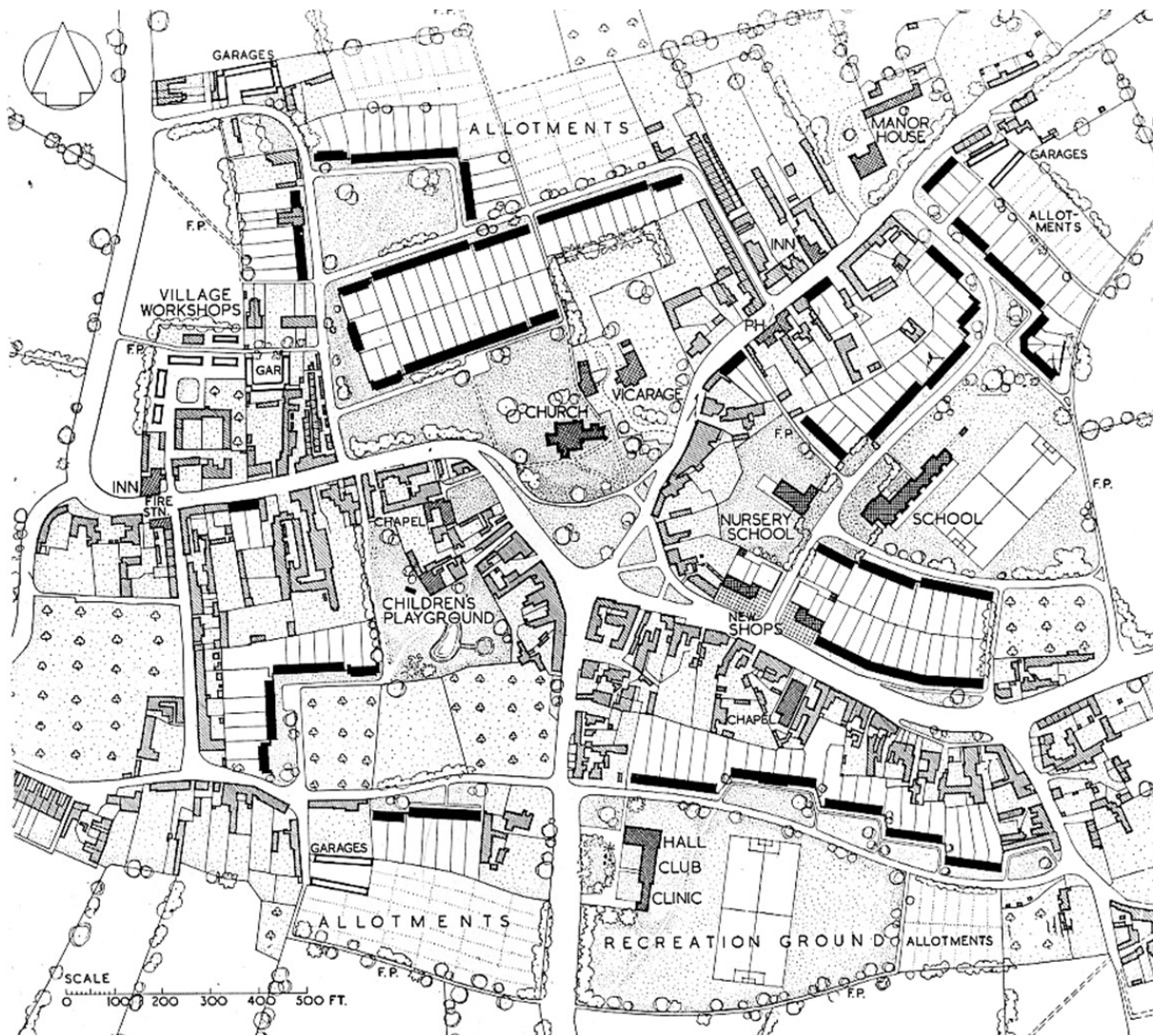


Fig. 5
Example of village extension. Strategy that integrates new and existing buildings maintaining the character of the village. From Housing Manual 1949.

problem is that the guide does not provide a strong and logical reason why a system of quadrangles is an efficient strategy for neighbourhood planning in functional, spatial, and social terms. As is clear in the second example, the main argument is purely visual and based on the need to 'achieve a greater degree of openness in the layout'⁴. To do that, it suggests changing the existing urban fabric in order to create larger plots with 'adequately' shaped gardens. The outcome is therefore a random neighbourhood

arrangement that responds to an indiscriminate proliferation of open spaces that results in a random neighbourhood layout.

One of the reasons for the above is the lack of a diagrammatic strategy that precedes the design example, which should be able to both express the disposition in the plan of the different elements of provision in a synthetic manner, and to establish a factual relationship between housing and infrastructure. Otherwise, the latter becomes a loose component for urban design, playing a secondary role in the organization of neighbourhoods, as happens in the 3 design examples included in the design guide.

⁴ Great Britain, Ministry of Health, *Housing Manual*, 1949 (London: H.M.S.O., 1949), p. 24.

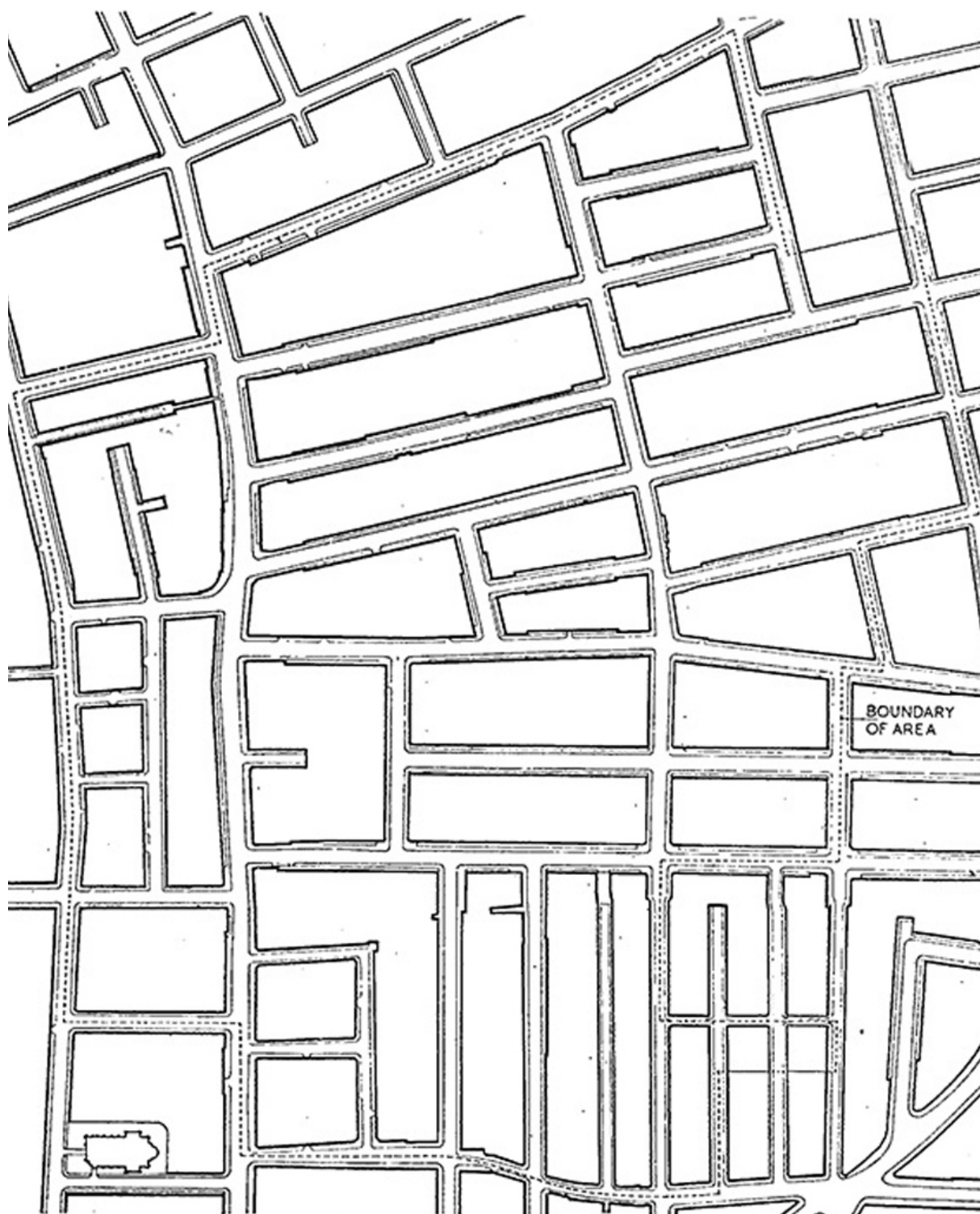








Fig. 7
Example of an area subject to urban redevelopment. From Housing Manual 1949.

-  · 3 STOREY HOUSES
-  · 8 STOREY FLATS
-  · GARAGES
-  · PLAYGROUND
-  · CAR PARK
-  · PUBLIC HOUSE

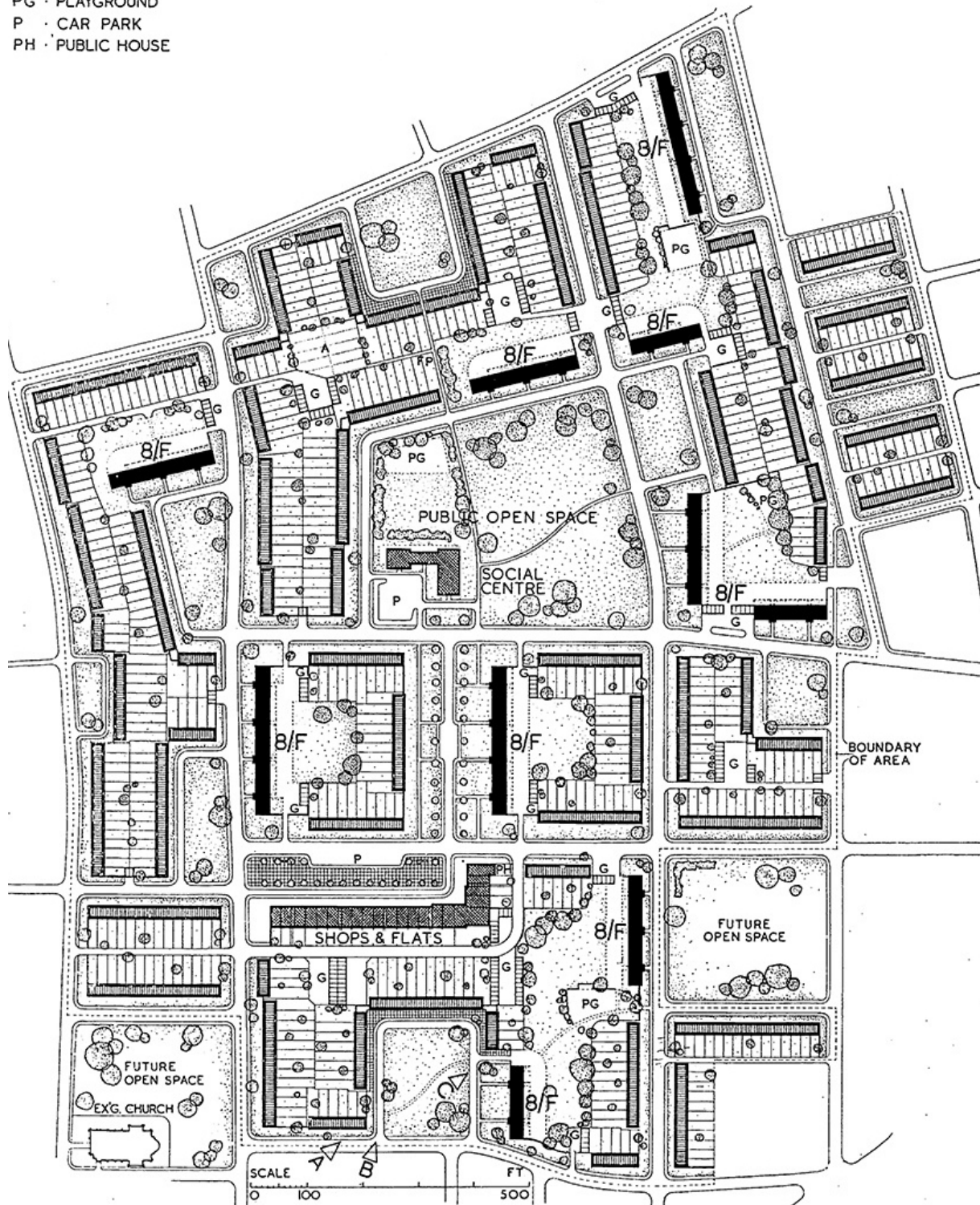


Fig. 8
Example of high-density residential arrangement in the urban redevelopment area. From Housing Manual 1949.






































УЧРЕЖДЕНИЯ	Величина микрорайона							
	6 тыс. жителей	7 тыс. жителей	8 тыс. жителей	9 тыс. жителей	10 тыс. жителей	11 тыс. жителей	12 тыс. жителей	13 тыс. жителей
Блок первичного обслуживания								
Детские ясли-сад на 280 и 140 мест								
Школа на 960 учащихся	8-летняя 	8-летняя 						
Школа на 1280 учащихся	11-летняя 	11-летняя 	8-летняя 	8-летняя 	8-летняя 			
Школа на 1600 учащихся			11-летняя 	11-летняя 	11-летняя 	8-летняя 	8-летняя 	8-летняя 
Общественный центр Тип I								
Общественный центр Тип II								
Общественный центр Тип III								

Fig. 9
The SNIIP document. Matrix of prescribed infrastructures (schools and shopping centres) according to size and density of Microrayons. From AA Files 55 (2004).

But to bring housing and infrastructure together, it is first necessary to rethink the importance of collective form in neighbourhood design. The problem of collective form should not focus on the creation of twisted housing blocks whose outcome is green areas without major hierarchy or differentiation of any kind. On the contrary, it has to be understood as a strategic means to install a functional and spatial order in neighbourhoods. To do that, it is necessary to break with the neutrality determined by a single spatial arrangement (quadrangle). In doing so, it is possible to ask for a range of urban design elements resulting from the formal combination between housing and the different infrastructures required at the neighbourhood scale. Once the main urban design elements are defined, these can be diagrammatically combined – thus producing multiple neighbourhood arrangements – to then become a contextual design example and not vice versa.

One decade later, a completely different approach to the provision of infrastructure and urban design was carried out in the Soviet Union through a housing design guide called SNIIP ('Planning and Construction in Cities and Urban Settlements'). This followed a highly ambitious political project – initially driven by Nikita Khrushchev, who became the party secretary of the Soviet Union after the Death of Stalin in 1953 – that aimed to modernize the spatial organization of Siberia. Specifically, through the creation of a system of autonomous but interconnected economic centres to be spread throughout the whole region. This was entirely based on a scientific approach committed to precepts of Taylorism, prefabrication, and mass production. The guide was conceived as an exhaustive and rigid compendium of standards for the provision of housing and infrastructure (Fig. 9). Alexander D'Hooghe describes the design concerns and scopes of the SNIIP document as follows:

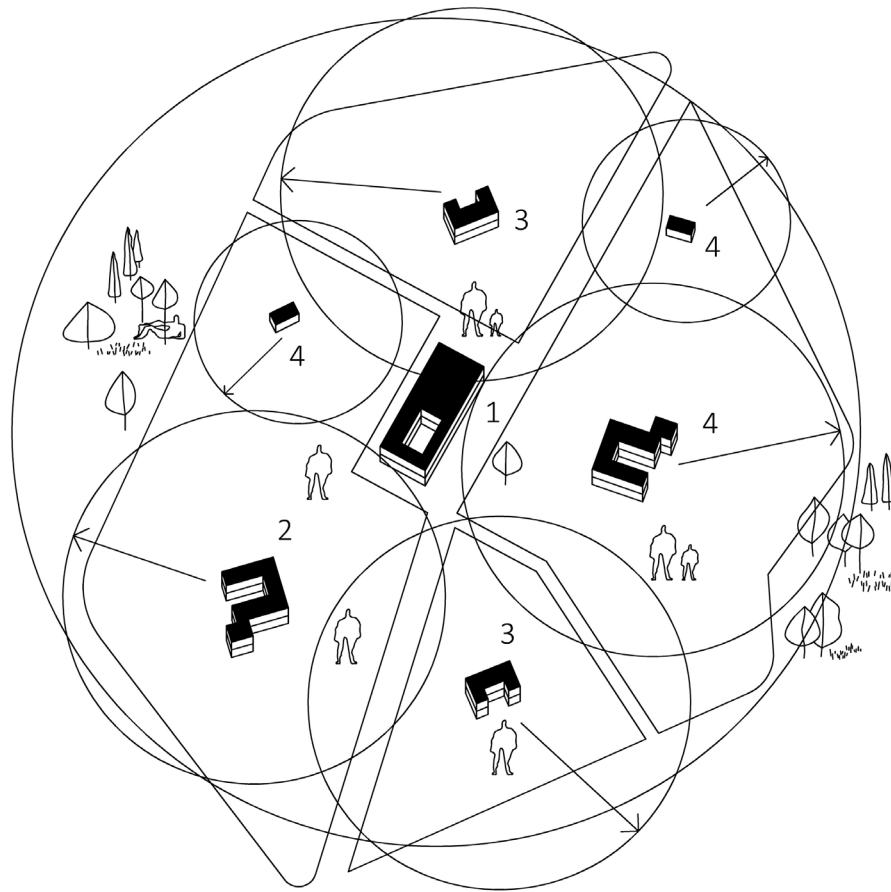


Fig. 10
The SNIp document. Diagram of Microrayon that indicates needed distances between schools, shopping and housing. From AA Files 55 (2004).

SNIp prescribed programme, surface and even form for new settlements. It dictated the amount of open space per person, the size and forms of schools, the number of markets and the quantity of their stock, the density in relation to the overall size of the settlement and the maximum distances between amenities.⁵

A most representative example of the application of this design guide is the urban settlement of Bio-Akademgorodok; a science complex located in the middle of a forest, a few kilometres from the city of Novosibirsk. It was organized based on two main

elements that consisted of a linear arrangement of laboratories and a residential district made up of a number of equally equipped neighbourhoods. The latter followed a planning concept incorporated in the SNIp guide called *Microrayon* ('small districts'). This accommodated from 4,000 to 20,000 people and was a totally prefabricated and self-sufficient urban unit that could ensure the essential conditions for the provision of social welfare. To D'Hooghe, 'the *Microrayons*' documentation shows us an algorithm for the prefabrication of all aspects of life [...]. All facilities necessary for everyday survival had to be within a short walk's distance'.⁶

The urban arrangement of the *Microrayon* is totally determined by its planning (functional) diagram that

⁵ Alexander D'Hooghe, 'Siberia as Analogous Territory: Soviet Planning and the Development of Science Towns', *AA Files*, 51 (2004), 14 - 27, (p. 23).

⁶ D'Hooghe, p. 23.

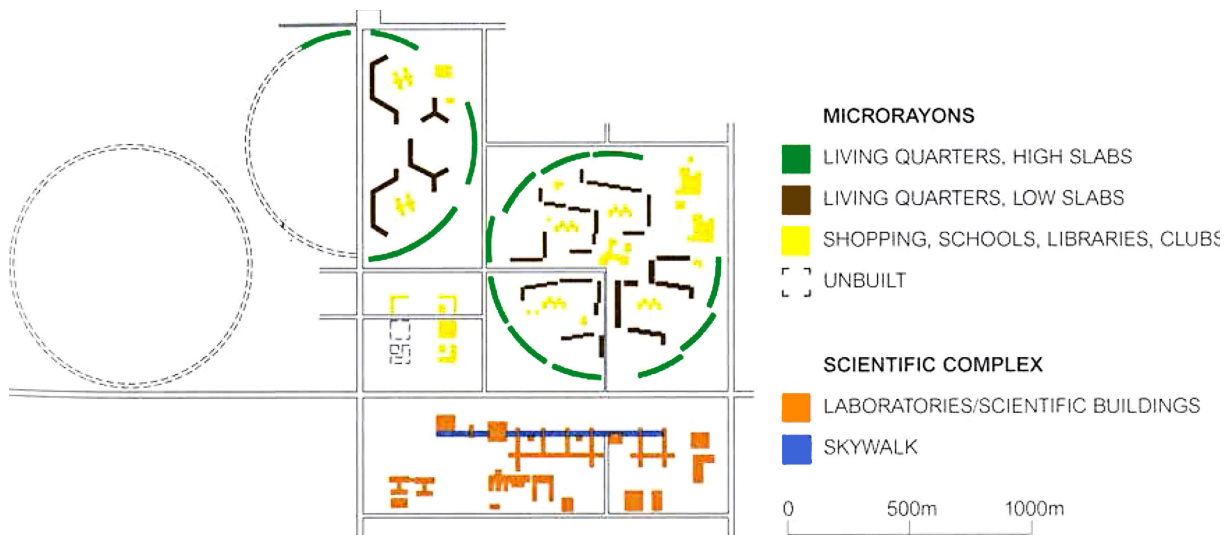


Fig. 11 - 12
Above: Application of the Microrayon diagram in Bio-Akademgorodok. Below: Photo of Microrayon in Bio-Akademgorodok by Bart Schoonderbeek. From AA Files 55 (2004).

unfolds within a circle of 1 kilometre in diameter. (Fig. 10) Through a highly synthetic drawing, this specifies a range of spatial issues such as differentiation and hierarchy of primary and secondary programmes, walking distances between housing and infrastructure, radius of impact of facilities, main streets, green areas, and urban boundaries. What is striking about the diagram is that when looking at its implementation in Bio-Akademgorodok, this is nothing more than a literal translation of its lines, bringing to the real world something otherwise belonging to the abstract and functional domain (Fig. 11, 12). The circle that defines the planning area becomes a huge ring of high-density slab blocks whereas the interior forms a vast garden

that respond to the suggested loose arrangement of different infrastructures – shopping, schools, libraries, and clubs – and low-density slab blocks.

The literal application of the diagram is to a great extent only possible in the Siberian context; an immense and mostly flat territory with endless tracts of forests that are rarely interrupted by urban settlements. This becomes clear when looking at the implementation of *Microrayons* in large cities such as Moscow or Kiev. Here, the diagram cannot be applied as in the case of Bio-Akademgorodok due to the existing conditions. The 'ideal' tracing of functional lines is abandoned in order to create layouts capable of adapting to

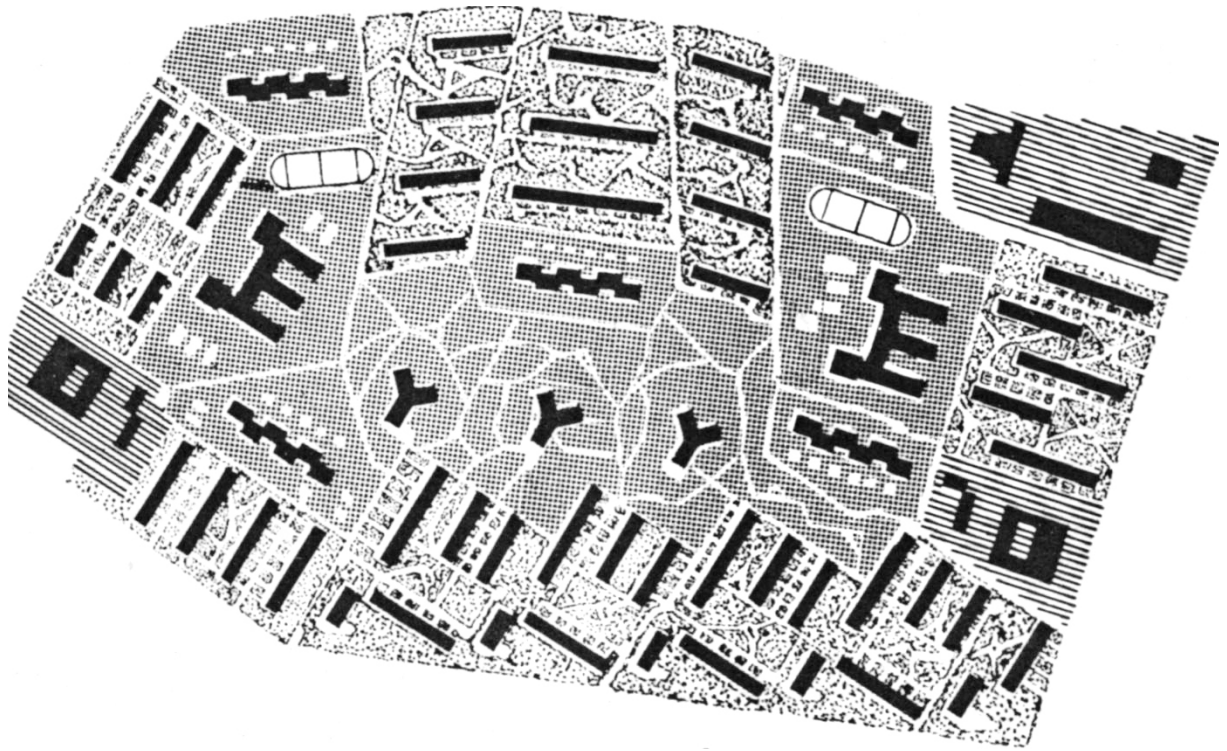


Fig. 13
Layout of Microrayon in Davydkovo, Moscow. From *The Soviet City* (1964).

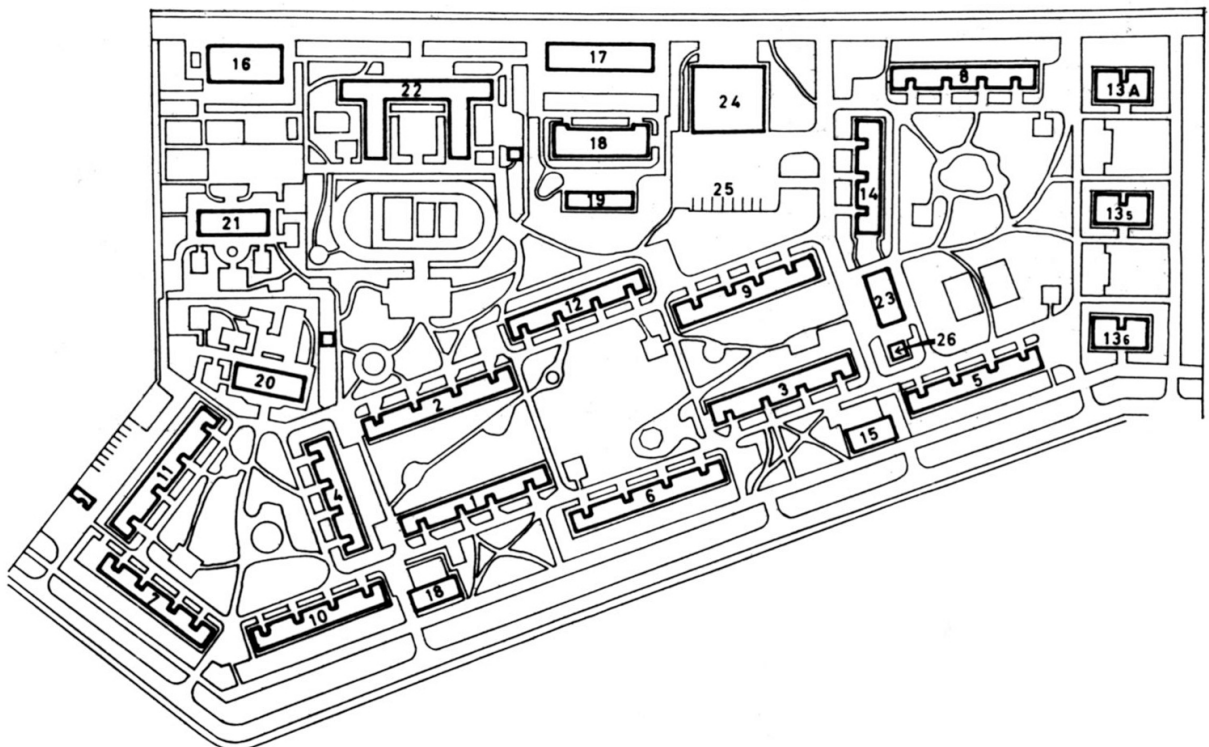


Fig. 14
Layout of Microrayon in the Ninth Section of Noviy Cheremushki, Moscow. From *The Soviet City* (1964).

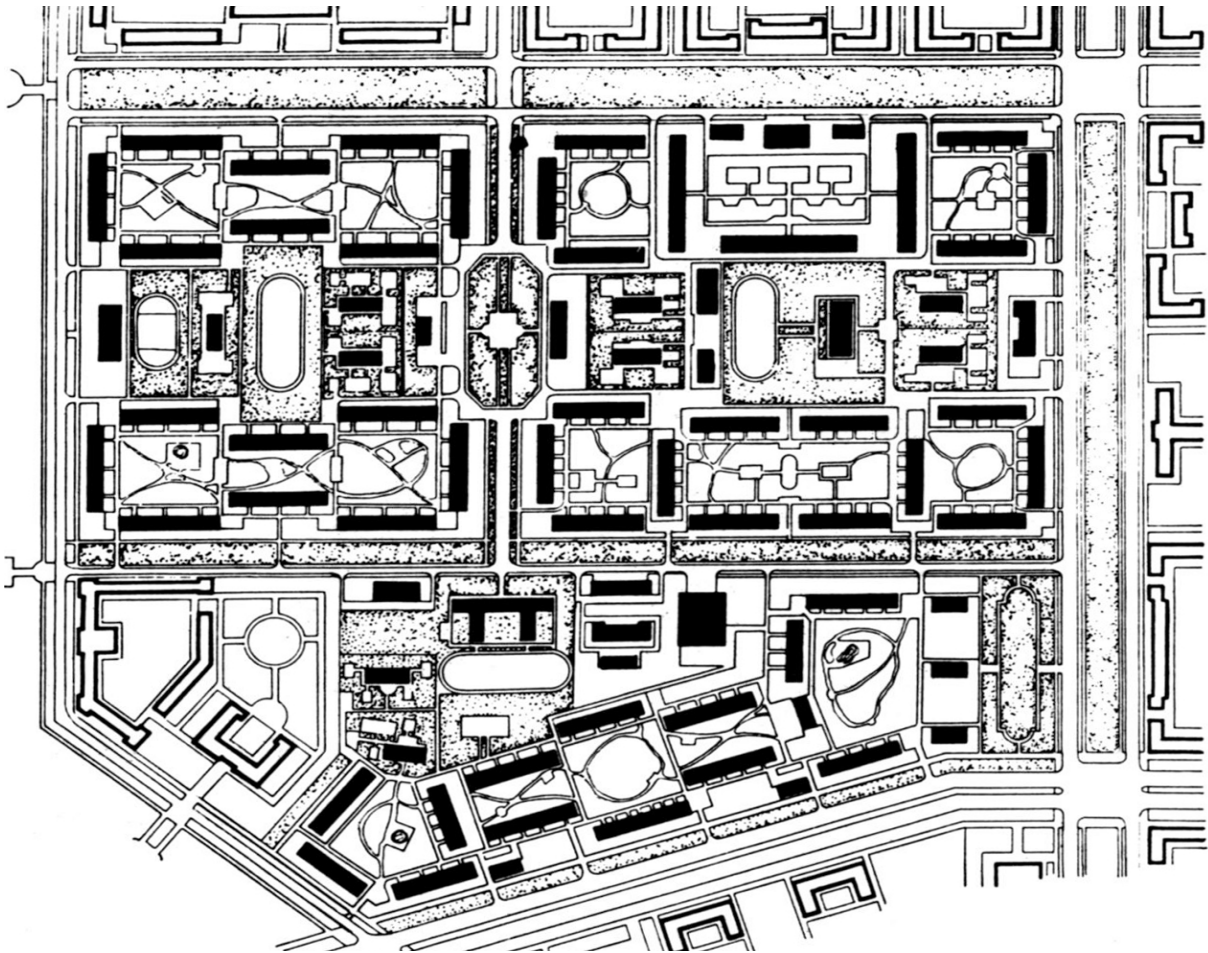


Fig. 15
Layout of Microrayon in the Twelfth Section of Novye Cheremushki, Moscow. From *The Soviet City* (1964).

different plot shapes and sizes that are, in fact, very different from the planning diagram proposed in the SNIp guide. The outcome of the application of this guide in urban contexts are neighbourhoods whose organizational structure has nothing to do with the one suggested by the planning diagram, thus failing to become a meaningful tool for urban design.

One of the reasons for the failure of the SNIp's planning diagram is the limited role that infrastructure plays in installing a rationale for the overall organization of housing and open spaces. Such problem is explicit in 3 examples of *Microrayons* built in the satellite city of Kryukovo during the 1960s, which dispose infrastructure either at the centre, corner, or side of the plot (Fig. 13, 14, 15). The planning considers only dimensional criteria, leaving aside other design aspects that a diagrammatic

approach to planning should include. These have to do with the need to provide spatial qualities to the different infrastructures. In doing so, it is possible to both define the organization of infrastructures in the urban realm and establish a clearer relationship with housing and open spaces.

Another reason that explains the failure of the diagram as a design tool in the SNIp document is its limitation in terms of scale. The prescribed diagram only targets problems of general planning, without considering intermediate scales capable of defining the relationship between buildings and their immediate urban environment. This explains the dissimilar schemes used in the 3 examples of *Microrayons*, which create either parallel, perimeter or courtyard arrangements. Hence, it can be argued that the diagram in neighbourhood design should

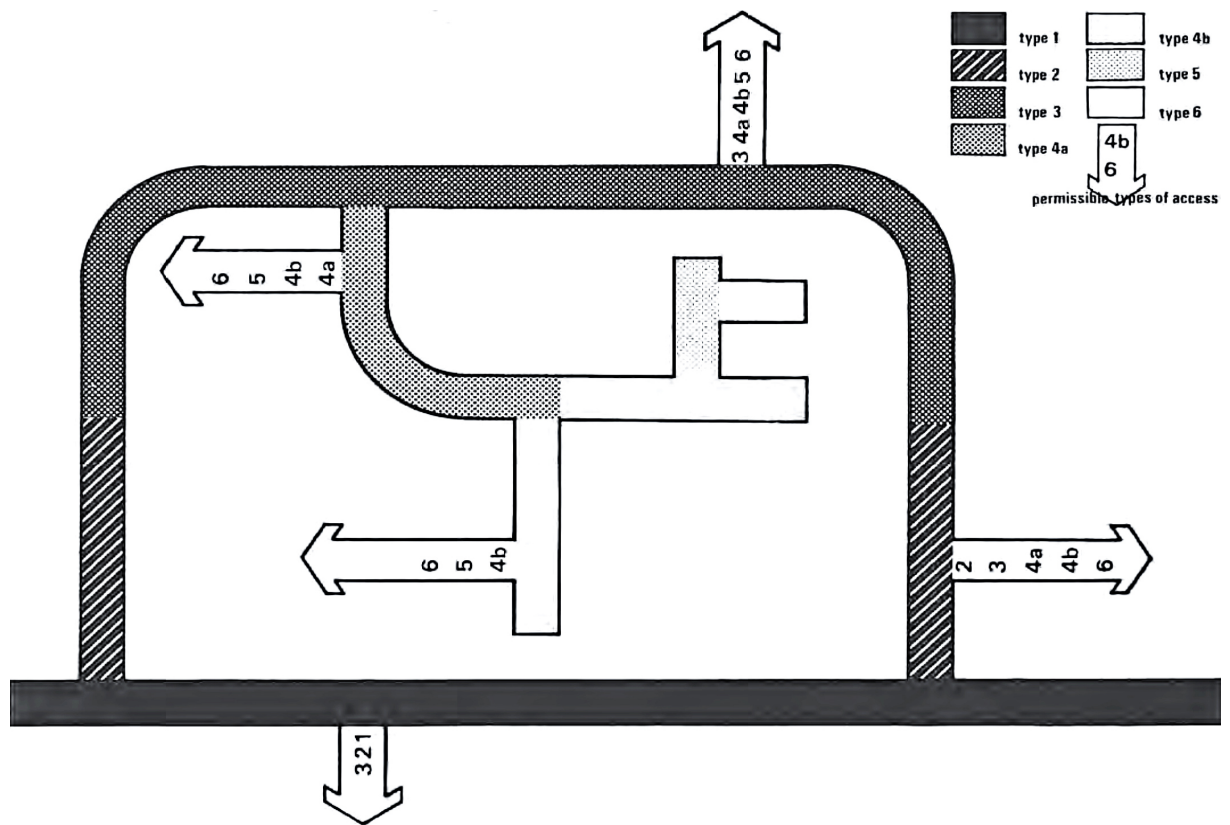


Fig. 16
Diagram that indicates hierarchy of streets. From A Design Guide for Residential Areas (1973).

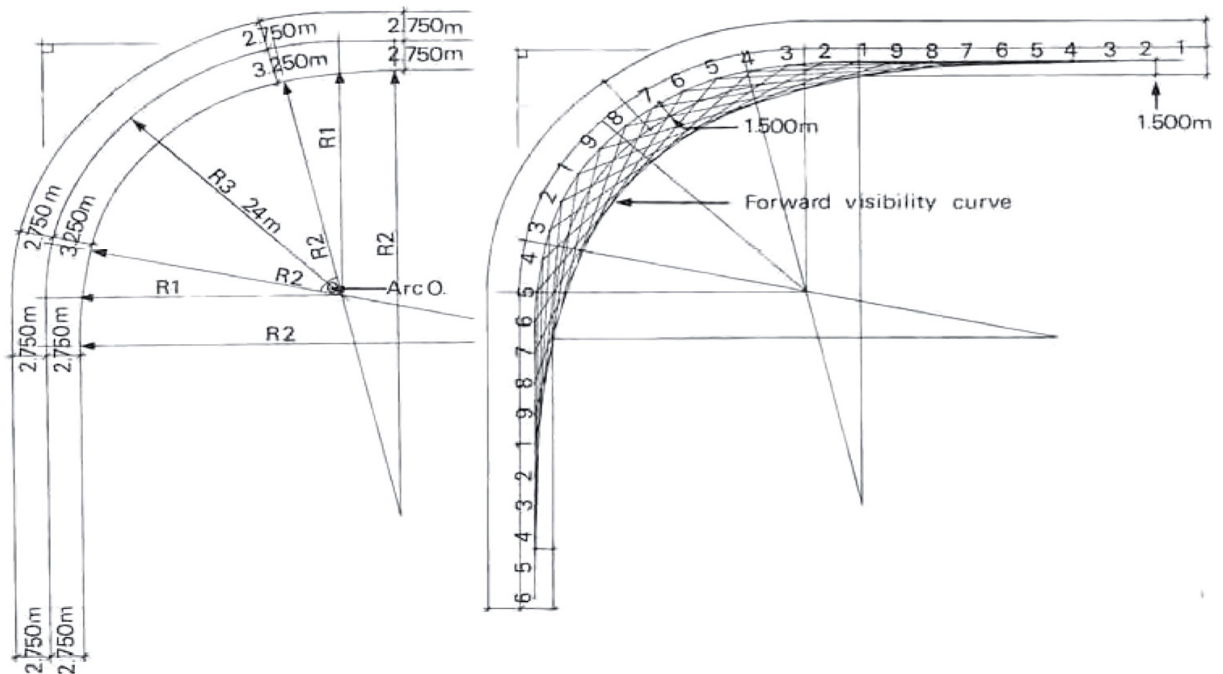


Fig. 17
Required visibility curves. Example of a 24 meters radius. From A Design Guide for Residential Areas (1973).

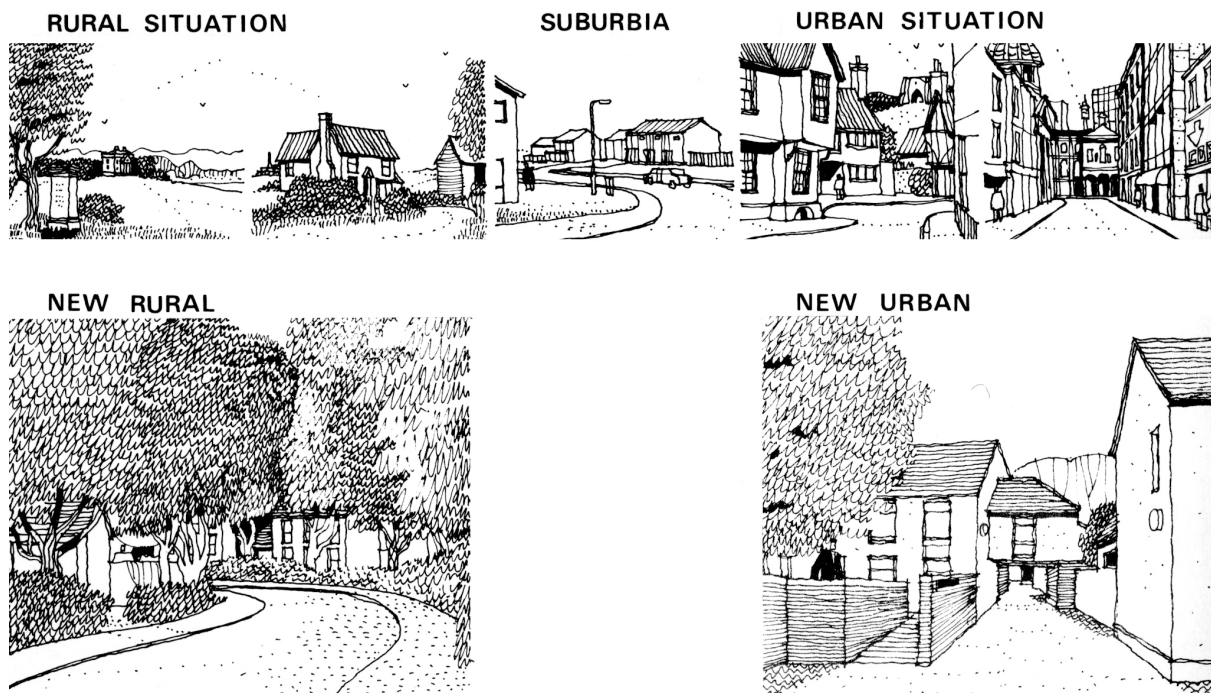


Fig. 18
The visual spectrum of settlement patterns: rural and urban situations. From *A Design Guide for Residential Areas* (1973).

not be understood as a single-layered system of relationships, but through a number of diagrammatic instances capable of bringing its different and interrelated urban scales together.

The importance of defining the spatial qualities of neighbourhoods was acknowledged in 1973 by *The Essex Design Guide*, more specifically, through the role of the street in the organization of these urban arrangements. The guide takes special attention to a range of street design issues that include technical, spatial, and visual aspects. These are defined by a diagram of street hierarchies that range from vehicular highways to minor drives and pedestrian footpaths, showing the transition from public to private domains (Fig. 16). Following this, the guide provides a highly detailed section on street standards such as minimum space dimensions, expected speeds, minimum radius, junction spacing, turning bays, maximum gradients, private entrances, and car parking (Fig. 17). The street standards are then followed by a section that focuses on visual criteria through a spectrum of settlement patterns. These include rural and urban situations, which should be treated with a specific street character

(Fig. 18).⁷ However, although the guide previously defines a number of street types, the only prescribed solution is the arcadia (Fig. 19, 20). The few planning considerations of the street approach to urban design are even more noticeable when the features of the arcadia are described. These features are limited to a number of isolated visual aspects such as landscaping issues and greening of sidewalks, avoiding to explain how this street type develops at the neighbourhood scale organizing public space, infrastructure, and housing.

The design limitations of *The Essex Design Guide* are reassessed in the versions of 1997 and 2005. In contrast to the previous guide, the different examples of street design are shown in their full extent by including different and more comprehensive tools of architectural representation. Axonometric drawings and floor plans, inform both the relationship among elements of design and the spatiality of the urban

⁷ Suburban settlements are discarded due to the relationship between landscape and buildings is loosely defined and therefore considered inappropriate for urban developments.



Fig. 19
Illustration of informal (left) and formal (right) arcadia. From *A Design Guide for Residential Areas* (1973).

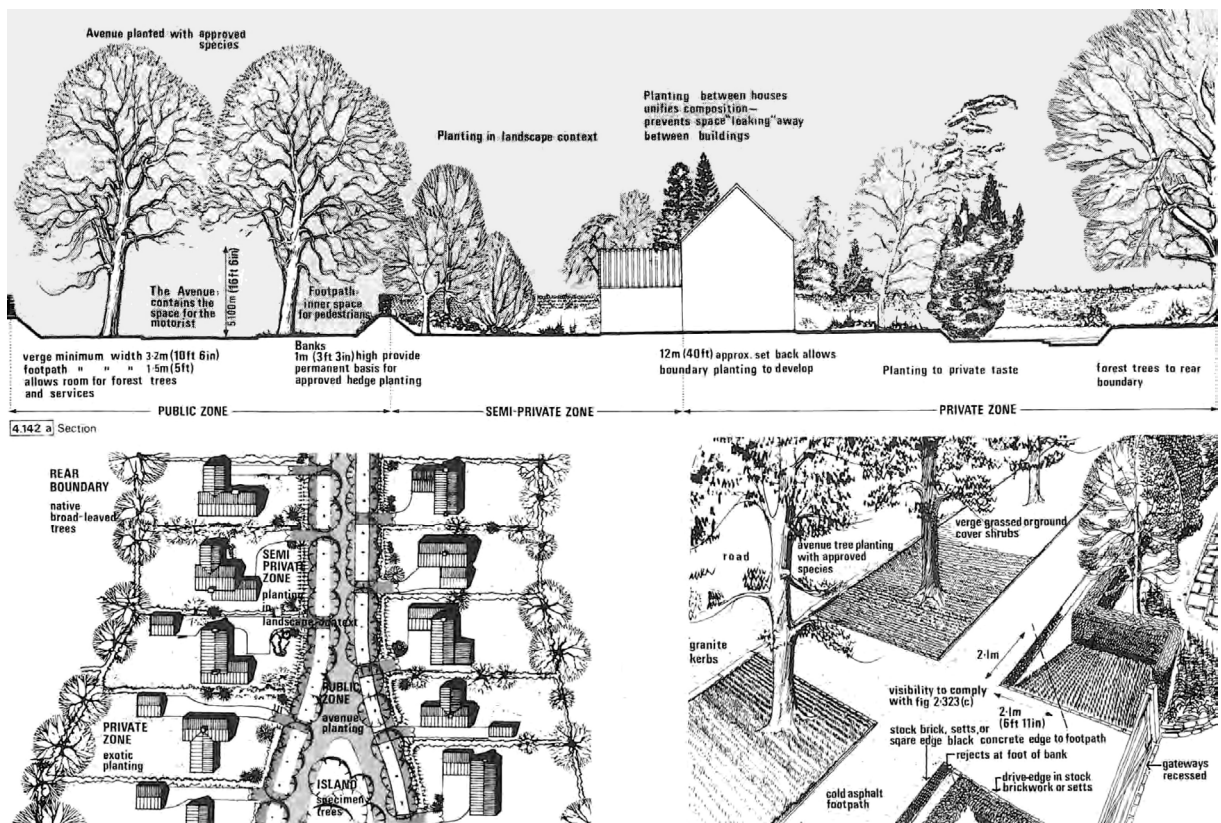


Fig. 20
Example of the application of the arcadia (section, plan, and axonometric drawing). From *A Design Guide for Residential Areas* (1973).

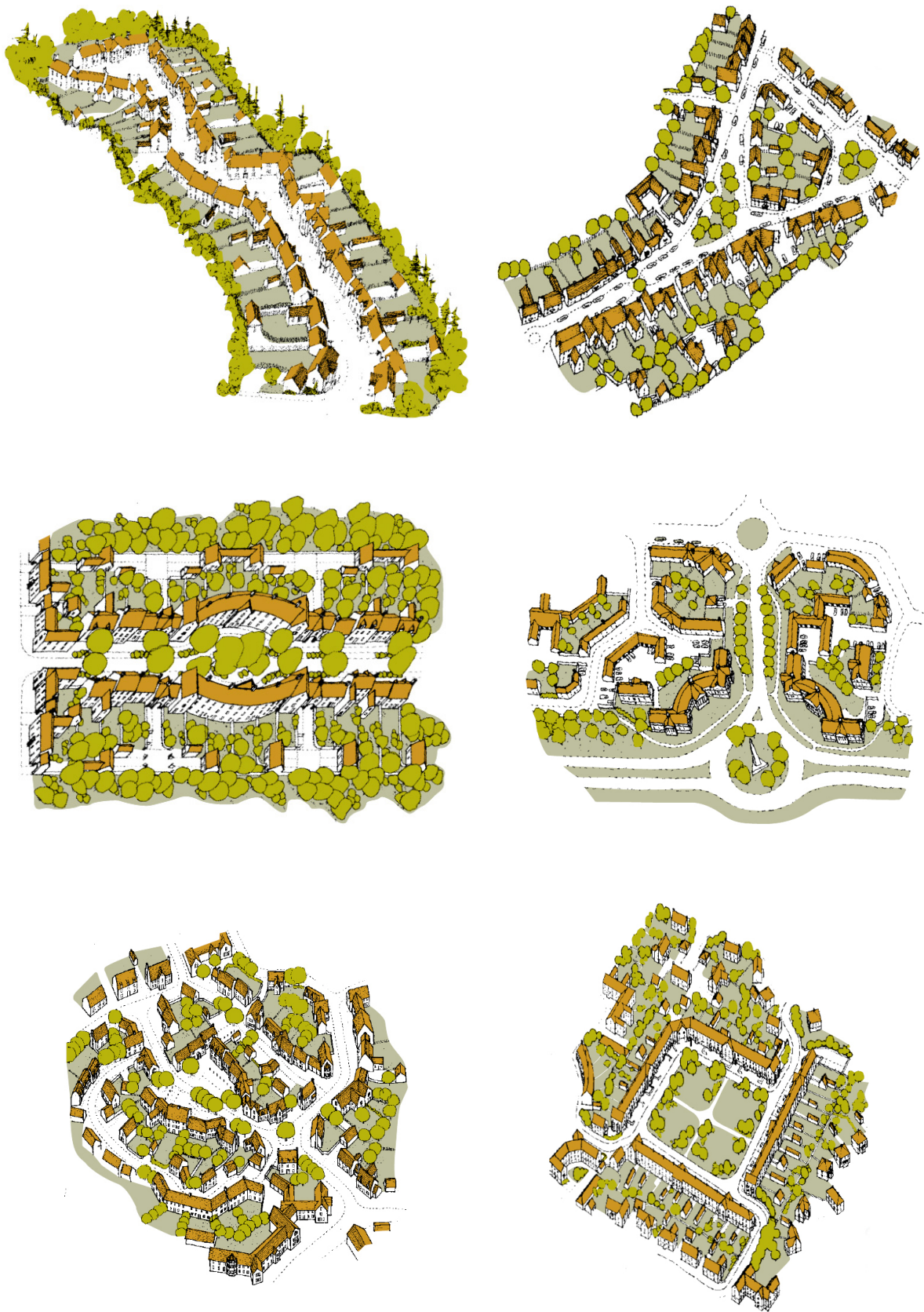


Fig. 21
Examples of urban arrangements. From The Essex Design Guide (2005).

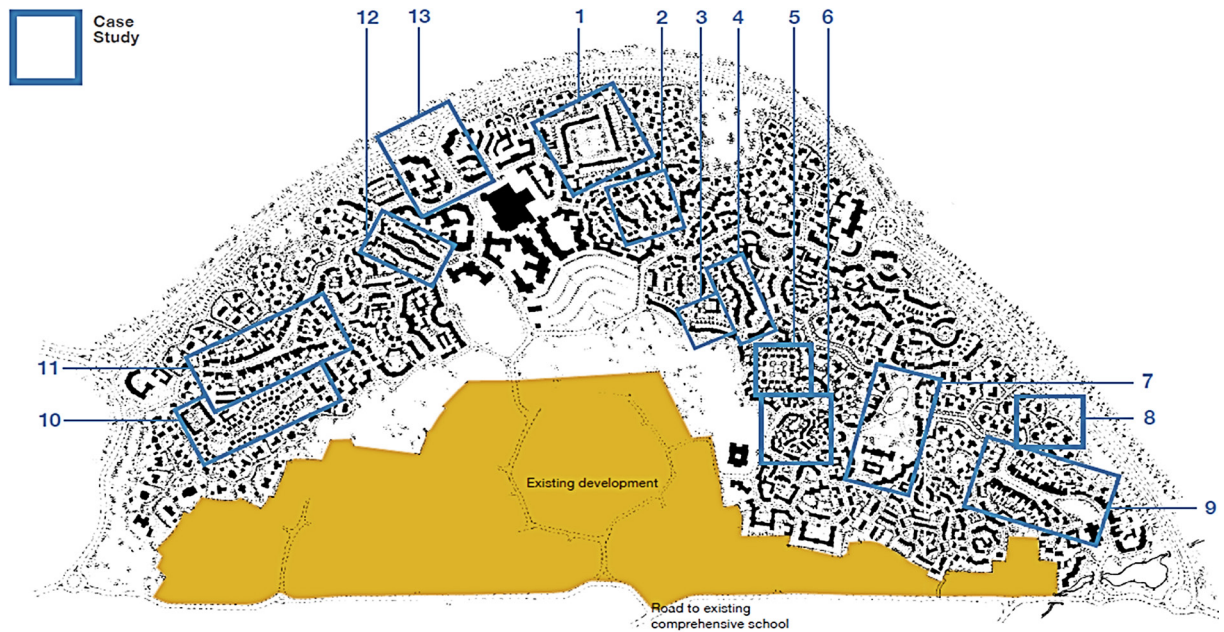


Fig. 22
Proposed masterplan that brings together the different design examples. From *The Essex Design Guide* (2005).

arrangements. In other words, the guide brings back a fundamental concern of the architectural discipline: to think and synthesize multiple design issues also through the problem of form.

Following the above, the recent versions of the *Essex Design Guide* provide a range of examples of street arrangements (Fig. 21). These are: urban street, village street, urban street with 2 and 3 storey housing, major entry point, urban layout, large landscaped square, boulevard planning, formal square, village green, urban village, pedestrian spine street, mews court, arcadia, and mixed use area, all of them defined with a stylistic character, which comes from the traditional English villa. The sum of examples could be seen as an attempt to create a catalogue of urban arrangements, among which it is possible to overcome prescriptive and limited approaches to urban design. However, the problem is that the provided examples are not designed to come together and thus produce a larger and interconnected urban system at the neighbourhood scale. This is clear when looking at the guide's proposed masterplan that aims to contextualize the different design examples (Fig. 22). Although the masterplan creates a spatial proximity between different examples, the problem is that it lacks an organizational structure capable of relating

one urban arrangement to the other. This way, the examples become nothing more than a number of isolated design instances that respond to a subjective general organization strategy. From this problem one can argue that introducing strategies for the assembly of the different design elements becomes essential for neighbourhood planning. This requires firstly to include a generic diagrammatic strategy that could bring together the different design elements, and secondly to provide a clear spatial and functional and hierarchy to each of them.

The lack of spatial and functional differentiation of design elements is also problematic at smaller scales. This is evident when looking at the only design example that includes infrastructures (Fig. 23). The urban layout proposes a commercial area at the main entrance (crescent), a pub in one of the central streets, and an industry (detached building) in one of the corners. What is confusing about this layout is that its spatial complexity is determined by totally random design considerations. The central space, which seems to be the organizational element of the general layout, is devoid of any specific function, being nothing more than a square surrounded by housing. Thus, it can be stated that providing generic diagrammatic strategies for the assembly of urban

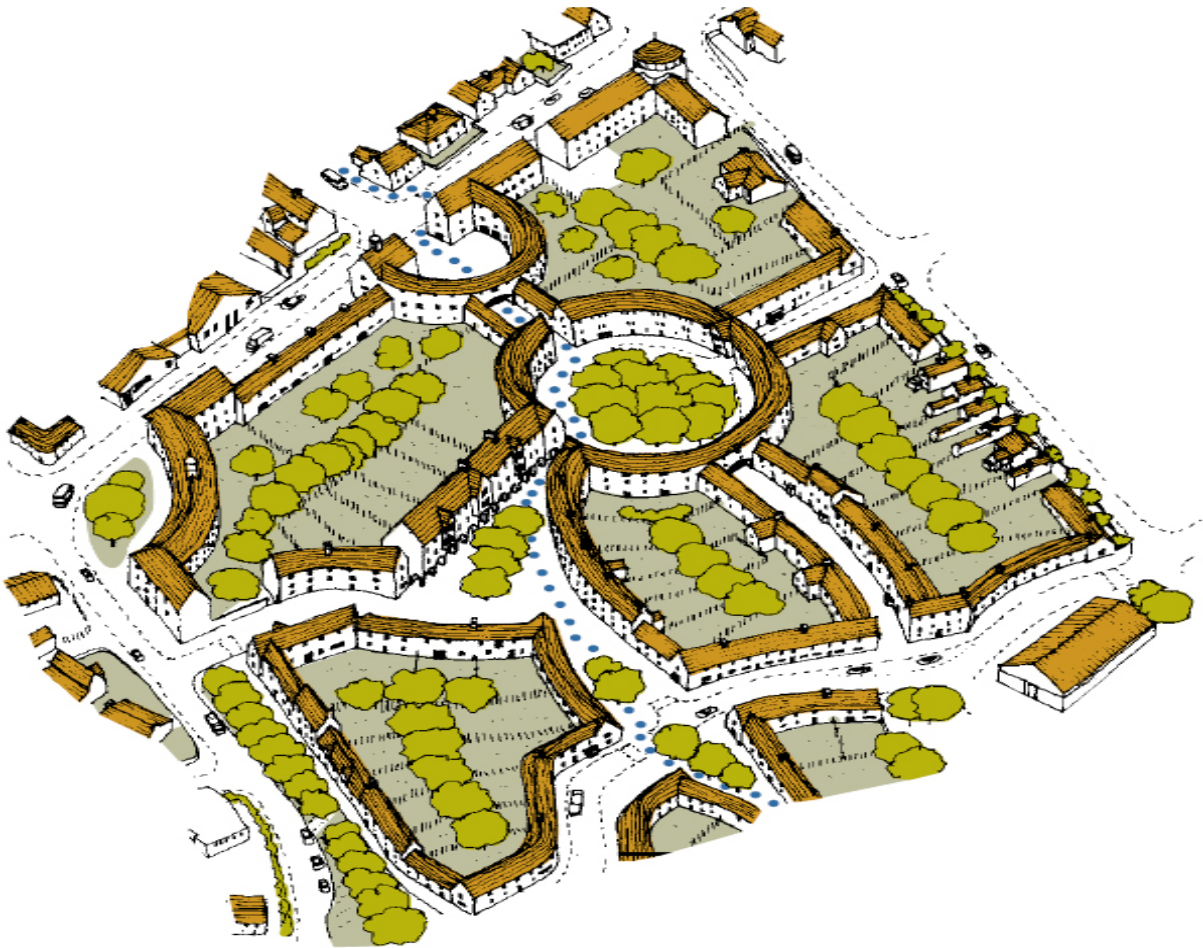


Fig. 23
Example of mixed use area. From The Essex Design Guide (2005).

elements is not only necessary at the larger scale of neighbourhoods but also at the scale of its mid-scale components.

Concrete Form – Abstract Form

From the different housing design guides described above it is possible to observe that incorporating an abstract and versatile design rationale for planning is a problem that has not been comprehensively addressed so far. On the one hand, the diagram has become a set of fixed and highly prescriptive indications that fail to produce multiple urban arrangements with a clear spatial and functional organizational system. On the other, the example has been seen as an autonomous design element that is

devoid of diagrammatic qualities and therefore cannot establish spatial and functional relationships at larger scales. Instead of choosing between the diagram and the example as opposite paths, Hyungmin Pai argues in favour of a dual understanding of the problem of design, which can become an answer to the biased approach of housing design guides. Particularly, by discussing the formal autonomy of the Beaux-Arts system and the functional idea of the diagram typical for the early twentieth century.

In the case of the Beaux-Arts training, it aimed for a comprehensive approach to design by bringing together spatial, structural, and stylistic problems. This idea was deployed under the concept of the *parti*, which is understood as a quick and diagrammatic sketch that highlights the essential aspects of a design (Fig. 24). It defines a plan to follow through

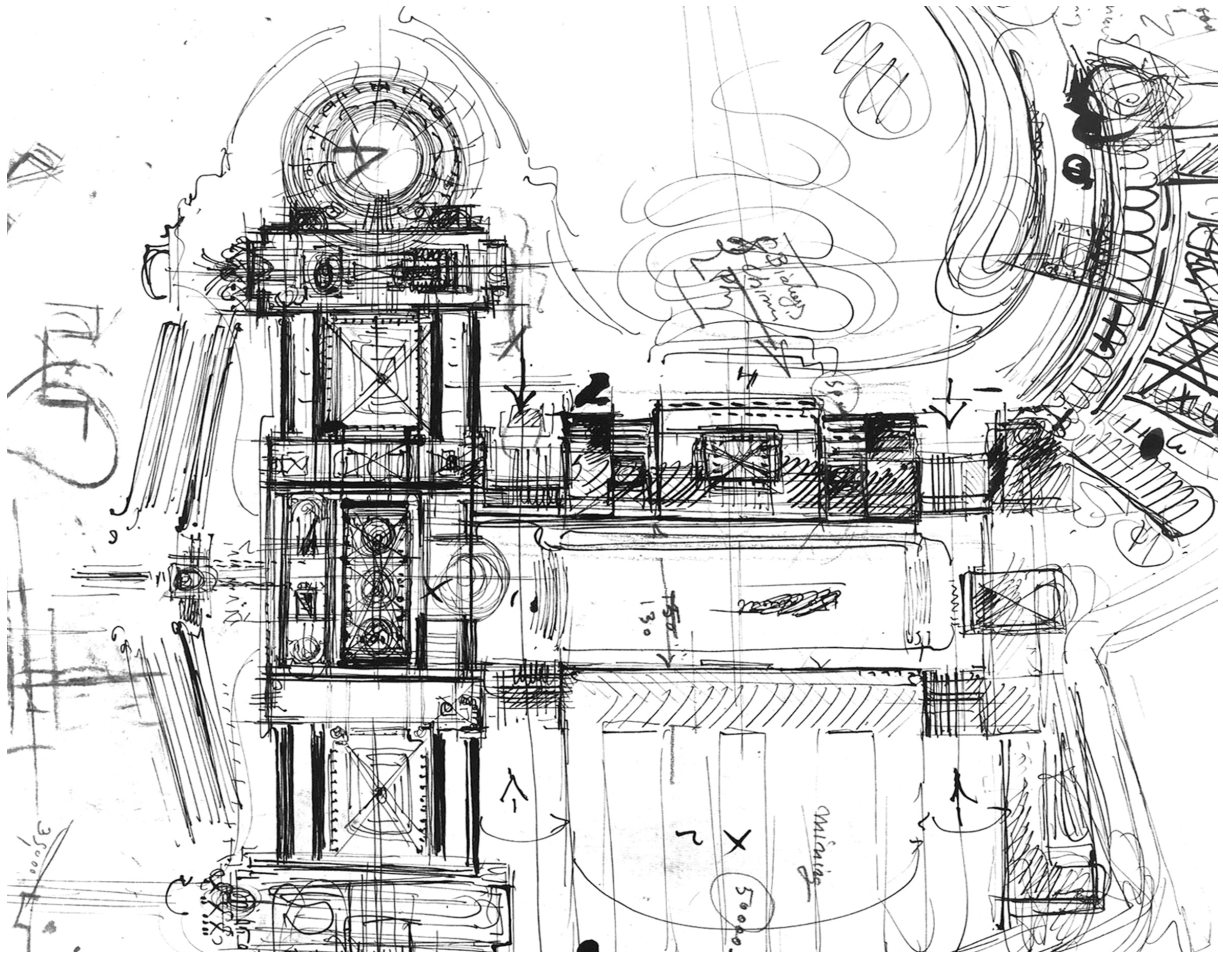


Fig. 24
Esquisse by Désiré Despradelle (1911). From *The diagrammatic construction of type* (2016).

a system of relations that goes from the individuality of the building element to the larger whole. As Pai explains, all parts coexist within an interconnected design framework: 'a column in relation to the entablature and base, a colonnade within a courtyard, a house within an urban fabric and so on'.⁸ Based on the diagrammatic strategy of the *parti*, the exercise of creation was determined by the ability of the architect to synthesize different design issues in a single drawing. This way, the diagram and architectural form are articulated within the limits of the plan.

Looking at the Beaux-Arts system, its design concerns are not very different from the ones of *The Essex Design*

Guide. In both cases, the individual strategy for the assembling of design elements – such as an arcade, boulevard or square – and problems of style come together in a single and fixed solution. However, the problem of this approach is that when architectural elements are overly defined, which in the case of the Beaux-Arts come from the classical tradition, the autonomy of form is limited. This means that the designer is subject to an existing menu of parts and its role is nothing more than arranging them, producing a highly restrictive design framework. Pai states that Jean-Nicolas-Louis Durand is the one who breaks with this closed system of formal relationships by focusing on the procedural aspects of architectural design. For Durand, style is a secondary design issue that does not interfere with the overall organization of buildings. Instead, Durand proposes a hierarchical system of spatial and structural axes

⁸ Hyungmin Pai, 'The diagrammatic construction of type', *The Journal of Architecture*, 20 [number 6] (2016), 1088 – 1104 (p. 1092)

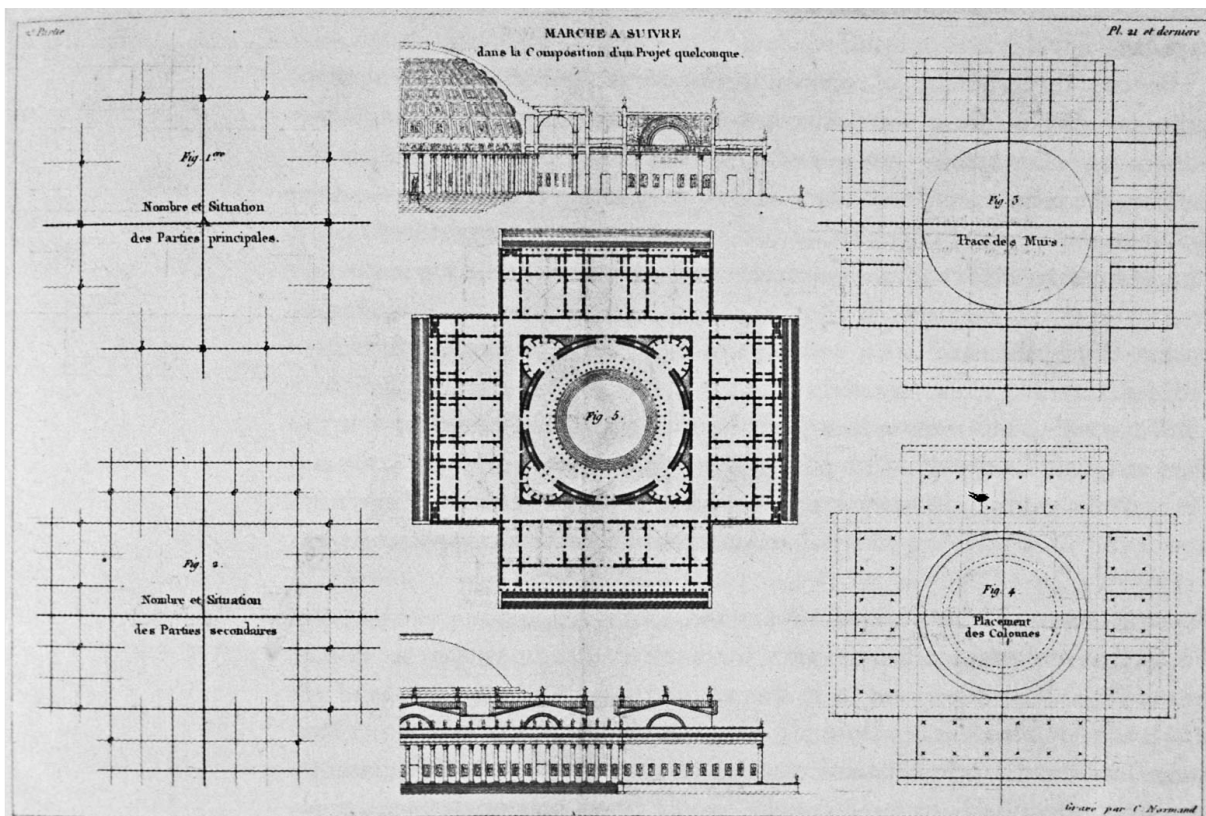


Fig. 25
Application of the principle of axuality by J.N.L. Durand. From *Précis des leçons d'architecture*, vol. 2 (1825).

that form the diagram of the building (Fig. 25). Through these, the compositional elements are not fixed and leaving open the problem of form. The main focus is on the axis, whose purpose is not to trace the building but setting an organizational basis for design. Based on this approach, although Durand focuses on buildings instead of urban arrangements, one can argue that setting an organizational basis for design should be a core concern of housing design guides. Thus, strategies such as the ones based on axial organizational structures can be an effective mechanism to bring together a compendium of dispersed design elements.

The fading importance of style ends with what Pai calls the 'emaciated *esquisse*'. This follows the diagrammatic approach but removes the basic elements of the compositional system. From such transformation emerges the functional diagram. Although it originally develops from the scientific management of labour and production – tracing abstract lines of movement of bodies or objects within a specific productive

domain – at the moment of entering into architecture, the diagram is nothing more than the representation of a functional programme. This makes of the diagram a set of differentiated activities demarcated by lines, creating autonomous entities such as bubbles or boxes that are literally translated as spatial limits (Fig. 26). This way, the diagram is understood as a device to produce a fixed form that is the outcome of an apparently 'efficient' arrangement of functions.

Exemplary for the translation of the functional diagram into design is the application of the *SNiP* guide in Bio-Akademgorodok. Here, there is no space for interpretation or conceptual bridges between the diagram and final form. In doing so, the diagram ceases to be effective due to it no longer being an organizational device for design, but an object (design) itself. Answering this, Pai states that if the problem of design is understood as an open system of relationships, the formal outcome 'is no longer the central visual object of a tightly visual woven analogical system but a loose diagrammatic

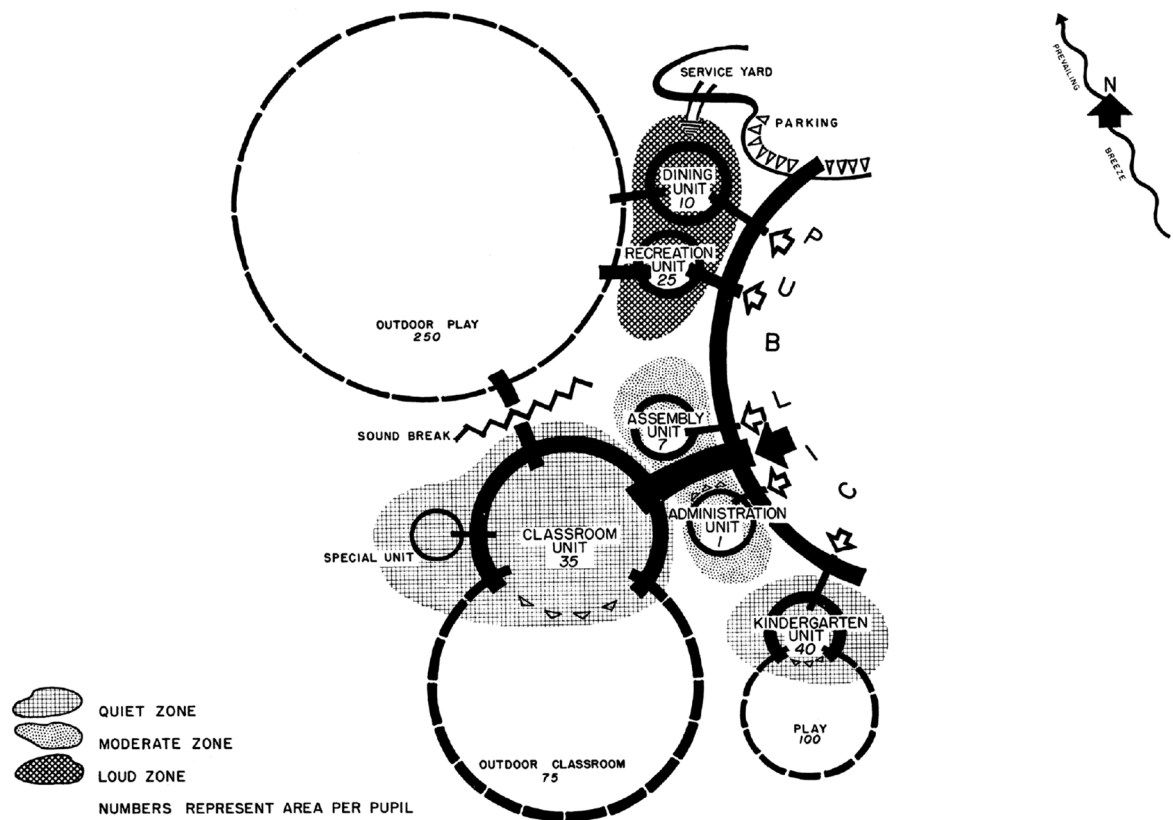


Fig. 26
Space relation diagram of a teaching space by William W. Caudill. From *The diagrammatic construction of type* (2016).

configuration [...] it is neither the emaciated *esquisse*, which continues to demand attention to its lines, nor the bubble diagram, which claims itself not to be form'.⁹ In doing so, the diagram becomes a powerful means to bringing a 'dispersed network together'.¹⁰

The counter argument to this abstract approach to design is that the suggested fabric of abstract diagrammatic relationships can fail in its attempt to become an assembled whole. Bringing this problem to the scopes of the housing design guide, it can be argued that a housing design guide should not only indicate desirable relationships among different design elements but also provide tools for design that can be transferred and thus applied by designers and urban planners. Following this idea, the diagram is not the only mechanism through which principles

of architectural and urban design can be transmitted and exercised. To the contrary, these principles can also be expressed through a range of design examples instead of a single and ideal one, as found in most of the above described design guides. However, this does not mean discarding the diagram as a design tool. Rather, it is about expanding and complementing the different representational strategies at the different scales of neighbourhood planning.

⁹ Hyungmin Pai, 'The diagrammatic construction of type', *The Journal of Architecture*, 20 [number 6] (2016), 1088 – 1104 (p. 1101).

¹⁰ Pai, p. 1101.

Housing as a Social Policy

Through the existing neoliberal housing policy, the Chilean state has avoided taking long-term responsibility for socially vulnerable groups. Apart from providing sub-standard dwellings, this also fails in creating adequately equipped neighbourhoods in which both social and physical demands are met. This radically differs from the ambitions of the first 'social neighbourhoods' at the end of the nineteenth century. These were provided by the Catholic Church and posed for the first time the question of housing as a means to ensure life quality.¹¹ The main concern was to address the poor living conditions – physical and moral – of the working class in overcrowded and insalubrious tenements. The answer to this problem was providing not only larger and healthier dwellings but also, and even more importantly, creating a specific lifestyle within neighbourhoods.

The different social concerns were applied in the Población Leon XIII (1892): a residential area next to the city centre equipped with a number of social infrastructures. These mainly consisted of a school, church, communal centre, square, and oratories which were spread in the neighbourhood and aimed at impacting directly on the lifestyle of dwellers (Fig. 27, 28). Here, education played a fundamental and symbolic role in the organization of the urban layout. The school was seen as the main entrance point to the neighbourhood. This produced an axial relationship with the rest of the facilities, which followed a secondary axis that visually dominates most of the urban interiors. According to Hidalgo, Errázuriz, and Booth, 'what this institution provided were not only private dwellings but also a particular type, a dwelling programme, a street design, a neighbourhood with defined neighbours, green areas, leisure places, and

meeting points; ultimately providing a way of life.'¹² The problem of the housing provision addressed both individual and collective concerns. Thus, 'the individual dwelling was not anymore a mere physical space, being displaced by several motivations and desires transformed in a moral and spiritual space.'¹³

The housing model proposed by the Catholic Church inspired in 1906 the creation of the first housing policy in Chilean history. So-called *Working Class Dwellings Act* (Ley de Habitaciones Obreras), this policy installed social housing as a meaningful concept for problems of provision and urban design. An example of the broad ambitions of the policy was its pilot project called Población Huemul built between 1911 and 1918. This housing complex was located in an industrial area of Santiago – next to a sugar refinery and a glass factory – developing in an extension of 7 blocks within a pre-existing urban fabric.

Although the Población Huemul was designed to accommodate only 166 houses, it included a large number of social services and communal facilities that did not only respond to problems of education but also of general welfare in order to answer a broad range of social needs (Fig. 29, 30). They consisted of a central square, 2 primary schools, library, theatre, conference hall, savings bank and social security building, orphanage, children's hospital, nursery, community kitchen (nutritional centre), communal laundry, church, shops, police station, and a residential building for singles (Fig. 31, 32, 33, 34, 35, 36, 37, 38). To install and run all these programmes, the state created a mixed system that

11 These concerns followed the precepts of the encyclical *Rerum Novarum* released by the pope Leo XIII in 1891.

12 Rodrigo Hidalgo, Tomás Errázuriz, Rodrigo Booth, 'Las Viviendas de la Beneficencia Católica en Santiago: instituciones, constructoras y efectos urbanos [The Catholic Charity Housing in Santiago: institutions, constructors, and urban effects]', *Revista Historia (Instituto de Historia Pontificia Universidad Católica de Chile)*, 38 (2005), 327 - 366. (p.342) [author's translation from Spanish].

13 Hidalgo, Errázuriz, Booth, p. 343.

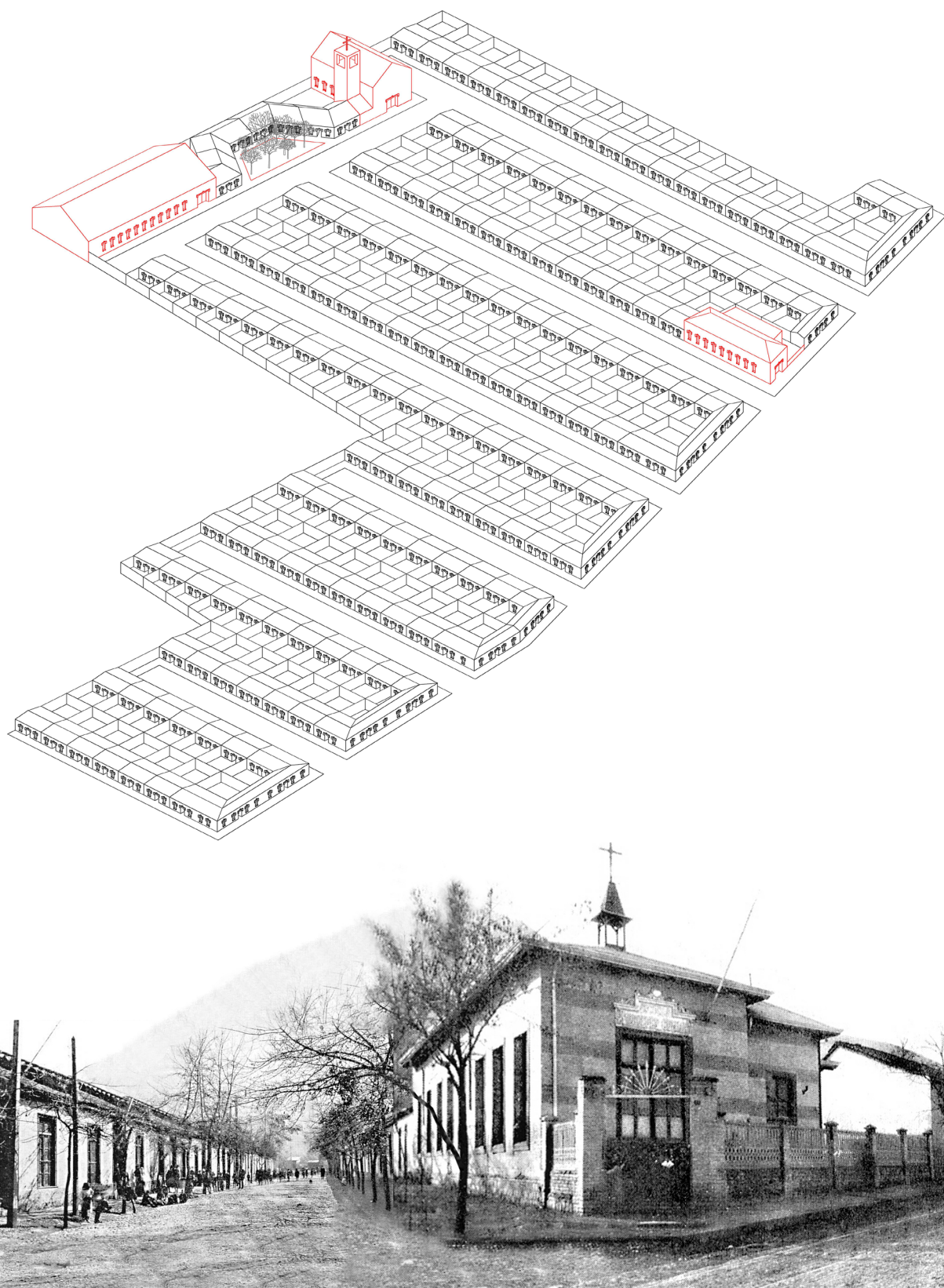


Fig. 27 - 28

Above: axonometric drawing of Población Leon XIII. Below: photograph of the school and the main axis by unknown author. From Población León XIII: Pasado y Presente.

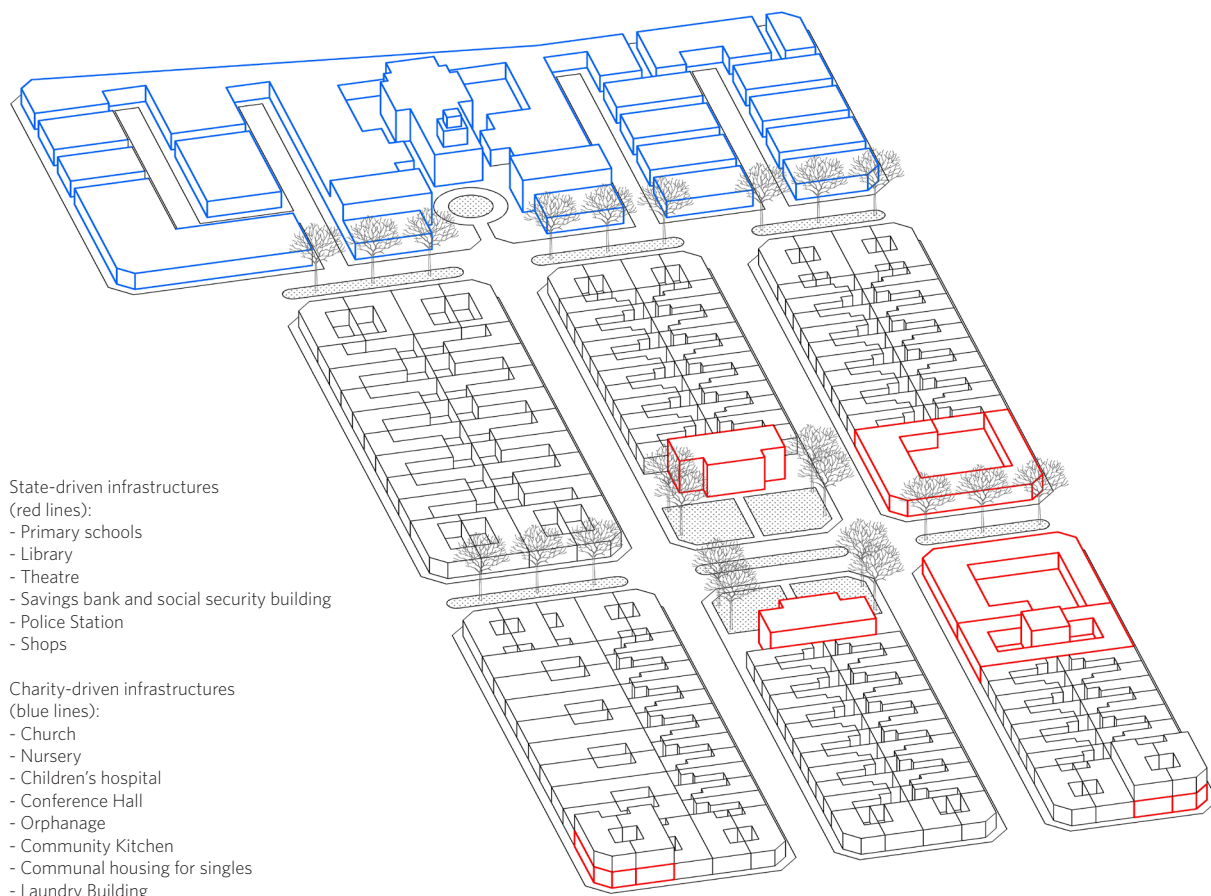


Fig. 29 - 30

Above: axonometric drawing of Población Huemul. Below: photograph of the infrastructural area run by the Catholic Church and Gota de Leche (charity institution). From Imagen ambiental de Santiago 1880-1930.

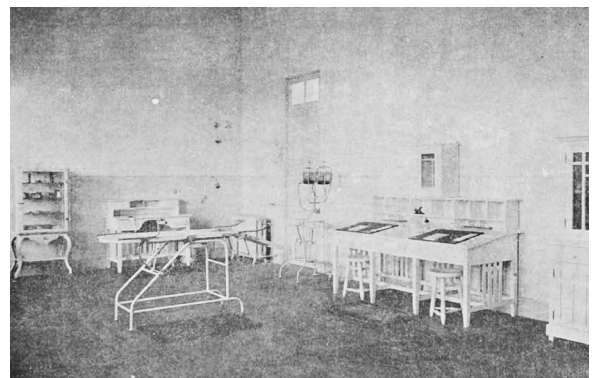
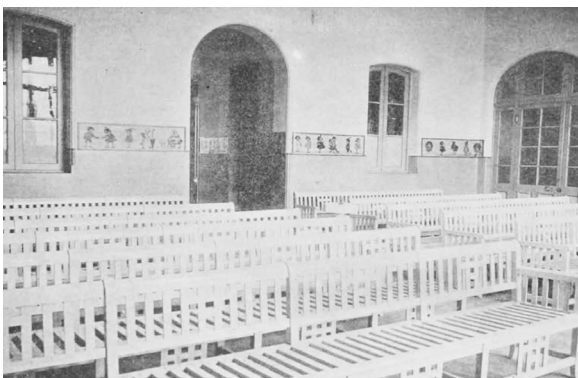
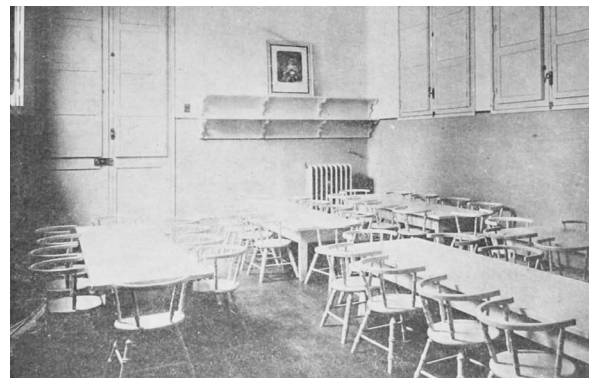
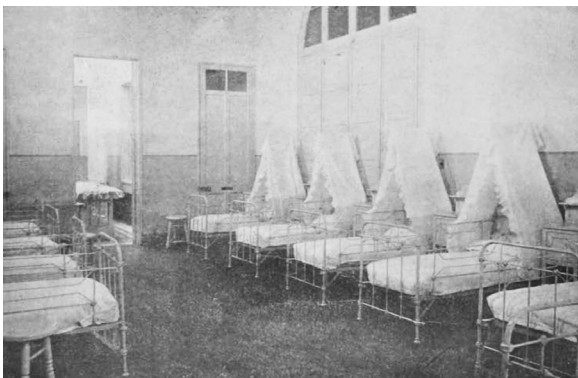
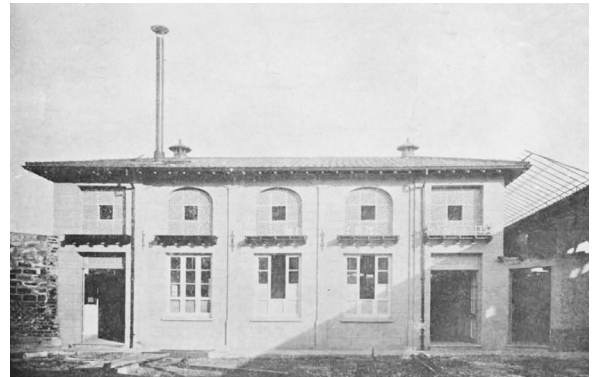
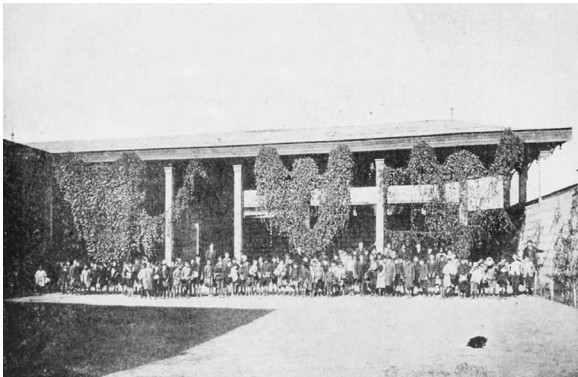
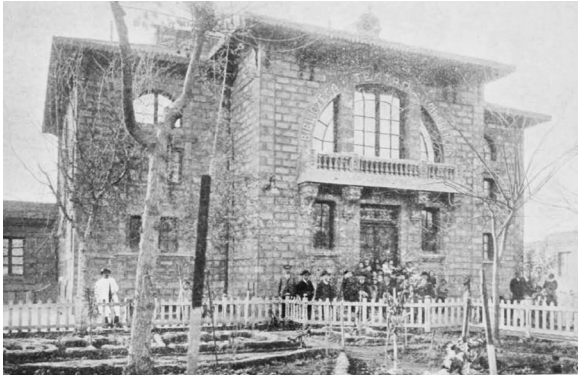


Fig. 31 - 32 - 33 - 34 - 35 - 36 - 37 - 38

Photographs of infrastructures in Población Huemul: theatre, savings bank and social security building, school, laundry building, nursery, community kitchen, conference hall, and children's hospital. From Población Huemul: Inauguración de la Sección Beneficencia.

included public and private funding. On the one hand, the state was responsible for problems of education, culture, security, and financial administration and, on the other, the Catholic Church and a charity called Gota de Leche dealt with problems of socialization, hygiene, motherhood, and childcare. This approach to infrastructural provision is in fact very different from the ones adopted by design guides, which define a list of desirable programmes for a 'standard' equipping of neighbourhoods. Such a logic translates into an undifferentiated proliferation of generic infrastructures such as shops, playgrounds, communal buildings, parking lots, and sports facilities, among others. In the Población Huemul, instead, the provided infrastructures are highly specific in social terms, aiming at dealing with the educational, economic, and health difficulties of people living in vulnerable conditions. This way, the neighbourhood as such was not a neutral space that concentrated people with identical needs, but a social laboratory that could respond to the unique circumstances and limitations of each individual.

Another remarkable aspect of the Población Huemul is that its multiple social services were thought in a larger context, aiming to become a social and urban centre for a poorly developed area in the southern periphery of Santiago. That is to say, the infrastructure was understood as a mechanism to promote and drive a process of urban transformation, which became effective through the construction of high density housing complexes in the adjacent blocks in the later decades (Huemul II and Huemul III developments). Despite the fact that the number of neighbourhood-designed housing developments was initially limited – mainly due to the proliferation of the Cité as a smaller housing solution that required less state involvement, coordination, and funding – the Población Huemul became a role model for an integrated housing and infrastructural provision, which was broadly applied from the 1940s to 1973. During this period, the state experimented with a number of housing policies and procurement systems. These included different actors (private enterprises, non-profit cooperatives and public institutions), housing programmes (whether they were based on tenure systems or home ownership provision through long-term loans), and direct state interventions based on the social use

of property (making available public or private plots within urban areas), among many others.

The wide range of mechanisms through which the state has historically ensured a quality housing provision are nowadays difficult to replicate. Precisely, because of the lack of major social considerations of the current housing policy that avoid acknowledging the welfare components that this should bring with it. The main reason for this is that housing is not seen as a social policy anymore. Instead, it is subject to a technocratic political framework that limits the state's commitment to low-income housing. The problem of this approach to policymaking is that although this can substantially increase public spending on housing and its associated infrastructures, social demands will always be only addressed partially. Hence, one can argue that re-signifying housing as a social policy becomes essential in order to affect the cultural, political, and economic development of the whole society. In relation to this, it is necessary to make the conceptual limitations of a social policy clear. To Richard Titmuss, the word 'policy' is broadly accepted as a means to make changes possible – whether these intend to impact on specific circumstances, systems, practices, or behaviours – transforming a pre-existing condition into another.¹⁴ The word social is, on the contrary, much more controversial and brings with it semantic difficulties. This is because it is signified differently according to the particularities of each historical and political context. Considering that, providing a precise definition of the concept of social policy is a difficult task. However, in general terms, social policy can be understood as an important part of governing and ordering both individual and collective interests. This, in order to attend a range of needs considered essential for the development of life. Although the notion of social policy has been defined in different ways – varying according to different ideologies and political regimes – Titmuss argues that what should persist is the idea of the state as the main guarantor of social welfare. The main concern of the state is to define and provide a set of basic services for the whole society. To do that, it has to

14 Richard Titmuss, *Social policy: An Introduction* (Michigan: Pantheon Books, 1974).

create mechanisms to collect and redistribute those appropriate resources – material and immaterial ones – for a general access to social welfare.

In *Social Policy: An Introduction*, Titmuss establishes a framework to understand this concept. He distinguishes among residual (exception), industrial (achievement-performance) and institutional (redistributive) models of social policy. The first operates only under extraordinary conditions. These are when householders are unable to afford costs of life or the market is not responding to their needs. To Titmuss, 'this formulation is based on the premise that there are two "natural" (or socially given) channels through which an individual's needs are properly met; the private market and the family. Only when these break down should social welfare institutions come into play and then only temporarily'.¹⁵ Social policies are seen as something provisional that are limited to the reinsertion of householders in the market. The second model derives from industrial economy and is based on the precepts of merit, work performance, and productivity. This model is conceived as a system of economic and psychological incentives – or compensations – determined by a ruling (exploiting) class. The third model has universal concerns and targets the whole society. It is understood as an institutional approach to welfare due to its idea of provision outside the market laws. This means assuming a state commitment in areas of vital welfare provision. The model, therefore, targets social and economic changes through the redistribution of resources, ultimately impacting on social equality.

In relation to the above-described models, the Chilean case sits between the residual and the industrial one. On the one hand, the provision of state services is only possible when the relationship between private supply and social demands is broken. On the other, the highly unequal distribution of wealth determines a rigid system of social stratification. Despite it providing social services that allow minimum subsistence, the problem of this hybrid model is that social mobility – understood as the possibility of people to overcome their social, educational, and

economic limitations – is not considered by the policy framework. One of the reasons for this is the above mentioned unequal distribution of wealth, creating a small but exceptionally rich group of people. It mainly consists of 5 economic groups that control more than 50% of the GDP, which ranks Chile as the country with the greatest income inequality between rich and poor within the OECD region. The problem of the current framework is that poverty is understood as a status quo. Based on this conceptual limitation, one can argue that the state betrays its role as guarantor of social welfare by understanding its 'social policies' as a set of isolated services that do not fulfil their role adequately. A social policy should not understand social mobility as an exception but as something desired – being therefore considered within the limits of the policy – for which is required not only one social policy but a number of coordinated state services.

In this line of thinking, in the *Theoretical Foundations of Social Policy*, Ricardo Montoro Romero argues that a social policy cannot be understood by itself but in relation to a system of complimentary policies, among which it is possible to guarantee the general access to welfare. According to Montoro Romero, this broader idea of social policy requires to be understood under a broader concept, which is the social state. One of the most distinguishing functions of the social state is that, besides incorporating civil-immaterial rights – traditionally with no economic costs – such as freedom or equality, it also establishes material rights – with clearly associated economic costs. This means that if housing is considered as a social right, this should be understood in relation to complementary rights. That is, undertaking all necessary measures to respond to problems of general existence that cannot be solved individually. As Montoro Romero clearly states, 'we have to understand very well that any modern social policy impacts, directly or indirectly, at all levels of society and, ultimately, affects the stability of society itself'.¹⁶ Hence, social problems ultimately affect the entire social spectrum and thus are not limited to low-

15 Titmuss, p. 31

16 Ricardo Montoro Romero, 'Fundamentos Teóricos de la Política Social [Theoretical Foundations of Social Policy]', in *Política Social [Social Policy]*, ed. by María del Carmen Alemán Bracho and Jorge Garcés Ferrer (Madrid : McGraw-Hill, Interamericana de España, 1997), pp. 33-50 (p. 38) [author's translation from Spanish].

income groups, nor people in exceptionally adverse situations. It is a problem that asks for a general commitment to welfare provision, for which the state requires defining a policy framework capable of securing a 'social contract' that can respond to social needs. In spite of the broad ambitions of the concept of social state, the main argument here is not calling for a violent remaking of the Chilean state's welfare services through an indiscriminate provision of social policies but to ask for an effective way by which social policies can start to be thought together, and how a comprehensive housing policy can become a strategic means to installing a social welfare agenda.

While through an ambitious housing policy it is possible to satisfy a number of needs – such as the access to the city, infrastructure, culture, and jobs, among others – that does not necessarily create a welfare state. This is a very important distinction in view of recent attempts of the Chilean state to install policies that aim to overcome social inequality. Gøsta Esping-Andersen in *The Three Worlds of Welfare Capitalism* explains that this is, in fact, a major challenge. According to the author, 'social scientists have been too quick to accept nations' self-proclaimed welfare-state status. They have also been too quick to conclude that if the standard social programs have been introduced, the welfare state has been born'.¹⁷ The legitimacy of this argument lies in the fact that most policymaking in Chile is highly determined by a subsidiary system that lacks profound social ambitions and affects all areas of social welfare. To Esping-Andersen, the concept of welfare should not be misunderstood as a range of simplistic social-amelioration policies. To the contrary, social policies have to be conceived in relation to a welfare-oriented socio-political structure. This ensures a universal access to general welfare through a comprehensive regime that articulates social, economic, and political problems.

Following Esping-Andersen's clarification, it is possible to understand that Chile is far from being a welfare state, even if a few social policies are in place.

However, it can be argued that if the Chilean state understands housing based on the broad notion of social policy, despite it covering only one area of social demands, this can have a large impact on the general provision of welfare. The main reason for this is the number of social welfare components that housing brings with it. These are related to the need of creating residential areas equipped with a range of physical and social infrastructures, requiring, therefore, a set of complementary policies aimed to secure a lifestyle to people. As a whole, while responding to the typical needs of everyday life, these policies are also seen as a mechanism to overcome social limitations. Thus, housing can be seen as a powerful means to install a different paradigm for policymaking, which might allow us think of Chile in terms of a welfare state in process of formation.

According to Esping-Andersen, a welfare state cannot be based solely on an industrialized form of production, providing degrees of welfare according to economic growth, but the conditions with which social rights are established must be independent from market forces. In this line of thinking, he recognizes two main principles for the creation of a welfare state. The first is de-commodification. This is in order to ensure the provision of basic social services – such as housing, education, and health – without depending on the market behaviour. The implementation of this principle becomes essential to rethink the quality of social welfare services in Chile. This is because in most cases the provision of social welfare services is subject to the will of the private sector to participate in that process, allowing them to negotiate the quality of these services with the state. The second principle consists of promoting social stratification as a means to create a differentiated labour qualification structure. This means that social welfare should be guaranteed regardless of the role that each individual has within the socioeconomic structure of the country. The importance of implementing this second principle in the Chilean context has to do with the need of both creating opportunities of social and economic development for all.

17 Gøsta Esping-Andersen, *The Three Worlds of Welfare Capitalism* (Cambridge: Polity Press, 1990), p. 20



Fig. 39
Aerial view of a gated community in the periphery of Santiago. Photo by Rodrigo Hidalgo.



Fig. 40
Aerial view of Bajos de Mena. Photo by Luis Eduardo Bresciani.

Neoliberal Planning

Based on the above, one can interrogate the role of neighbourhood planning in the enhancement of the two fundamental principles of the welfare state; by neighbourhood planning here meaning the creation of socially integrated urban areas with access to social services supported by public infrastructure. That means that social stratification should not translate into systems of residential differentiation and socio-spatial segregation. This is one of the most severe problems of Santiago, which creates high concentrations of poverty in vast areas of the city. The magnitude of this urban phenomenon has led the state to take action on this matter based on a technocratic policy called *Social Integration Subsidy*. Despite it financially encouraging developers to mix different income groups in housing developments, the lack of architectural and urban design considerations associated to this policy led to new forms of spatial segregation.¹⁸ At the neighbourhood scale, low-income housing is disposed totally different from that for other income groups. Each kind of housing is provided with its own access, infrastructure and communal spaces.

One of the outcomes of socio-spatial segregation is the proliferation of gated communities (Fig. 39). This is a highly internalized urban model that privileges communal-private spaces to the detriment of public ones. Its boundaries are defined by fences and walls, creating a very explicit limit between income groups. This way, public streets become mere spaces of circulation and separation. This prevents the emergence of commercial activities in public spaces, which, instead, is concentrated in other private facilities such as shopping malls or strip malls. In relation to this problem, Gonzalo Cáceres and Francisco Sabatini argue that despite the fact that this urban model produces a socially and spatially fragmented city, reducing the scale of segregation of low-income groups has positive aspects. The main argument is that it fosters a strong exchange of supply

and demand for domestic services and creates new facilities such as small shops.¹⁹ However, the problem of this theory is that it requires bringing together diametrically opposing social groups in order to create a strong demand for jobs and services. That is to say, it only considers high-income and low-income groups, leaving aside mid-income ones, which is the largest social strata in Santiago. Hence, such a theory cannot be applied as a general strategy for the creation of economic activities in neighbourhoods.

Although the *Social Integration Subsidy* has been operating for almost 10 years, very few housing developments have made use of it. The first reason is that the amount of money assigned to the subsidy is not sufficiently attractive for housing developers. As other subsidiary policies, this is completely based on incentivising private investors. However, when this premise fails, its implementation remains uncertain. The second and most important reason is that it works only when higher income groups are seeking more affordable plots. This means that they move to less central and usually poorly equipped areas, which turns the subsidy into a mechanism to prevent the expulsion of low-income groups to the most distant periphery. This way, the state expects that mid-income groups will gradually bring private infrastructures and services to the periphery. The problem is that through the subsidy, the state avoids taking responsibility for the provision of infrastructure, which is instead subject to the economic success of mid-income groups. If the state wants to promote social integration through subsidies or other incentives, one can argue that these should strategically operate in sectors of the city understood as 'neighbourhoods of social interest'. The aim of these should be to densify and strengthen central but poorly developed areas of Santiago. Such conditions are indeed very common for a significant portion of the city, which despite having low-density levels has access to the underground transport system.

18 The social integration policy is actually very limited in terms of the proposed social mix, which only considers a social spectrum ranging from low-income to low-to-mid income groups.

19 Gonzalo Cáceres and Francisco Sabatini, *Barrios Cerrados en Santiago de Chile: entre la exclusión y la integración residencial* [Gated Communities in Santiago de Chile: between exclusion and residential integration] (Santiago: Pontificia Universidad Católica de Chile, Instituto de Geografía, 2004).



Fig. 41
Typical street condition and absence of urban design in Bajos de Mena. Photo by Juan Francisco Lizama Lopez.



Fig. 42
Example of urban regeneration in Medellin: a public library within a slum. Photo by Municipalidad de Medellin.

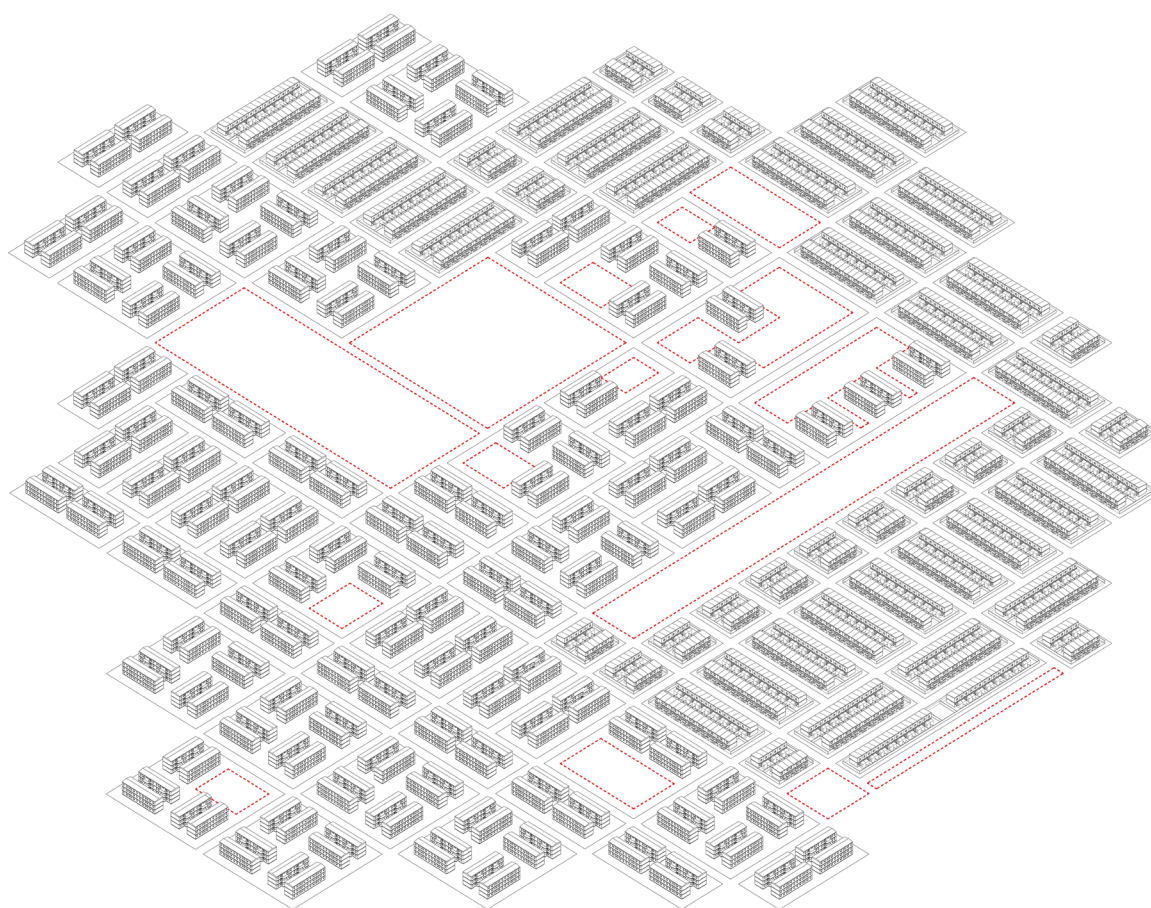


Fig. 43
Axonometric drawing of Bajos de Mena before the urban regeneration plan.

Having said this, the need for ensuring access to social services through public infrastructure has also been problematic in recent years. Exemplary for the current approach to this problem is the urban regeneration plan of Bajos de Mena: a 600 hectares residential area that is today considered the largest housing ghetto in Chile (Fig. 40, 41). Bajos de Mena was originally a set of agricultural plots located next to an informal rubbish dump in the southern periphery of Santiago, some 20 km from the city centre. Due to the low cost of land – the cheapest in the city – 49 social housing projects were built here between 1994 and 2003, totalling 25,466 dwellings. This concentrated 122,278 poor inhabitants in a large and highly segregated area of the city. Bajos de Mena was completely devoid of minimum infrastructure and job opportunities. In this area, it was impossible to find a single school, nursery, police station or primary health care facility. The architecture of Bajos de Mena is nothing more

than the arrangement of row houses and slab blocks (mainly scissors blocks). Of these, the slab block is the most common type, providing more than 70% of the housing. The dwellings do not exceed 42 m² and are of low construction standards (mostly clay brick systems), which in many cases were not even met by developers.²⁰ The housing is arranged according to a policy called high-rise social condominiums; a system of co-ownership barely regulated and with no funds for maintenance of public areas, which creates security issues.

²⁰ This problem became explicit for the first time in 1997 with the Copeva Housing. This was a project of 1708 dwelling units that did not fulfilled the minimum construction standards and underwent heavy wall floods during the first winter, which forced its inhabitants to abandon their houses due to the inadequate minimum living conditions.



Fig. 44
Axonometric drawing of the urban regeneration plan of Bajos de Mena.

Aiming to revert this situation, the state created an urban regeneration plan based on recent examples of slum regenerations in Medellín and Rio de Janeiro, whose strategy consist of improving the connectivity of low-income housing areas and providing urban facilities such as civic centres, libraries, sports halls, and green areas (Fig. 42). Following these examples, Bajos de Mena is aiming to become an adequately equipped neighbourhood over a period of 8 years (Fig. 43). Although a range of infrastructures can provide an 'urban' image to suburban areas and eventually a sense of security to its inhabitants, the problem is that most of them are mainly physical infrastructures that are not intended to overcome social limitations. Most of them are devoid of an intrinsic function capable of effectively impacting on people's lifestyle and possibilities of development. This is clear looking at the proposed concentration of infrastructures at the centre of the neighbourhood

(Fig. 44). The most important space is a boulevard that accommodates a large commercial area, police station, fire station, administrative facilities, and a sports hall. Thus, it is mainly about infrastructures for consumption and control. The rest of the programmes are social infrastructures, which play a secondary role in functional, spatial, and symbolic terms. Instead of establishing an open relationship with the environment, these are clustered around a 'cultural' square consisting of a school, nursery, health centre, and communal facilities. In doing so, they do the opposite to what the Población Leon XIII proposed: an expanded but visually interconnected system of infrastructures that aims to intervene in the spatial environment as much as possible, and thus impact directly on people's lives.

Apart from the buildings, the urban regeneration plan also includes a greening strategy that has a



Fig. 45
Example of the transformation of abandoned open spaces into green-communal areas. Photos by Fundación Mi Parque.

twofold objective. The first is creating a park at the centre of the neighbourhood, which will be built and maintained by the state. The second is transforming abandoned open spaces in green-communal areas through a bottom-up approach that requires an active participation of neighbours in the construction process (Fig. 45). By engaging the community in small landscape projects, it is expected to promote a spirit of camaraderie and solidarity among dwellers, creating an apparently 'socially assembled' neighbourhood. However, although this strategy recognizes the relevance of social relationships in shaping residential environments, the problem is that these can fail or disappear over time. The cause for this is the absence of a long-term mechanism that could be constantly weaving and supporting social networks, as happens with social infrastructures. Particularly, the ones related to education such as schools, which tend to be highly valued by the community, often creating a civic and safe environment in their surroundings.

Public School Education as a Driver of Neighbourhood Planning

In relation to the civic role of school education, Juan Eduardo García-Huidobro explains that this should not only be a pathway to incorporate children into society but also a milieu that promotes principles of coexistence in society. The school should be seen as a social experience in which individuals are recognized in egalitarian terms, as part of the same collective construction, in spite of their contextual differences. According to García-Huidobro, 'this learning process transforms individuals into citizens and, in doing so, creates (recreates, reproduces in many generations at the same time) democracy'²¹. Following this idea, democracy is not an abstract concept detached from social practices but requires to be constantly exercised as a participatory mechanism that defines issues of general interest. In relation to this problem,

21 Juan Eduardo García-Huidobro, *Educación Inclusiva y Democracia* [Inclusive Education and Democracy] (Santiago: Universidad Alberto Hurtado, 2013) <<http://biblioteca.uahurtado.cl/ujah/reduc/pdf/pdf/txt1058.pdf>> [accessed 25 July 2016] (p. 2) [author's translation from Spanish].

education has the responsibility of communicating what is common and to educate citizens in order to take care and promote democracy. This way, apart from transforming students into citizens, the school also collaborates in transforming society into a democracy. This conceptualization of the role of school education is, however, problematic when looking at the case of Santiago. Here, the school has been understood as an opportunity to create a system of social divisions, which is criticized by García-Huidobro in the following way:

School tends to reproduce the society and its current privileges rather than restrict them. Moreover, the reality of some countries like Chile seems to show that the school can go further and contribute not only to reproduce social differences but also increase them. [...] Here, education becomes predominantly a commodity that is bought according to the financial circumstances of each income group. The wealthy send their children to expensive private schools, mid-income groups to schools with 'average' prices, and the poor to free schools funded entirely by the state. Who pays for a good education is paying to separate their children from the majority, keeping them with their social class. The outcome is clear: a great social homogeneity within schools and strong social differences among them. In other words, great segregation and no social mix.²²

The Chilean state has recently acknowledged the above-described problem through an educational reform that eliminates mid-income schools, creating a large and unified public school education system. By means of this, the state aims to overcome existing mechanisms of social segregation and thus set a cultural basis for the creation of a more egalitarian society. However, this reform will hardly succeed if it is understood by itself. This needs to be thought in parallel to an ambitious urban reform. The main reason for this is the social homogeneity of neighbourhoods. This means that although mid-income groups will

22 García-Huidobro, p. 7.

now go to public schools, there are no associated policies capable of ensuring a social mix. Thus, schools will be made of people belonging to the same social group. Conversely, if low-income groups are still being pushed to the distant and segregated periphery, the outcome will be the same but with a different social composition, ultimately reproducing the already existing social pathologies. Hence, if the problem wants to be addressed comprehensively, it is necessary to think about a different and broader policy framework for neighbourhood design; one capable of providing social welfare by including different income groups, public schools, and other infrastructures needed on a daily basis.

Considering the importance of education in providing social welfare, one can propose public schools as the cornerstone of the planning process of socially-driven neighbourhoods. Following on this, if accessing the underground transport system is a mandatory requirement for these areas, the planning process should, therefore, be guided by the need for a network of schools in the proximity of metro stations. If the average density for the design of socially-driven neighbourhoods is to be around 1000 inhabitants per hectare – based on the building and block solutions proposed in the previous chapter – that would require building 1 school for every 4,000 people; a number that can be achieved, for example, with 8 high-density blocks of 40x100 meters.²³ This means that a densification process requires a strong state commitment to the provision of schools, and a plan to bring educational infrastructure and urban design to poorly developed neighbourhoods. I therefore propose a strategy for the hierarchical differentiation of school infrastructures (Fig. 46). This can respond to the context of each neighbourhood – such as a proximity to metro stations – creating different street systems, which can be organized according to radial, linear, or axial arrangements.

The proposed is based on the existing educational system which is divided into primary and secondary schooling, and for which the state provides different building programmes. Primary education is the same

for all, whereas secondary education splits in science and humanities and technical schools. A main difference is that secondary education has a greater demand for infrastructure. It requires more facilities such as labs, workshops, sports halls, and theatres, among others. Following the existing educational system, neighbourhoods should be planned based on three main strategies. The first is bringing together secondary schools by creating an infrastructural core that works as a neighbourhood centre. This can be both shared by the different educational buildings and used by the community during afternoons and weekends. The second strategy operates conversely and is based on the spread of primary schools, creating a system of neighbourhood sub-centres. This has the aim of bringing social services closer to the community, which is also an opportunity to create communal-green areas. Such a scheme can overcome existing problems of social signification and maintenance of those spaces. The third and final strategy is based on connecting the range of educational infrastructures through boulevards. As hierarchical streets, these are seen as the natural space to accommodate commercial areas and other small-scale private programmes, which can create a spatial and infrastructural continuity from metro stations to secondary schools, and from these to primary schools.

The proposed neighbourhood planning system is not a fixed diagram nor a masterplan but suggests a set of hierarchies and infrastructural relationships that can adapt to different contexts. In fact, these relationships should proliferate to the extent that neighbourhoods develop and consolidate over time. This is a very important consideration for the success of the proposed system, which requires setting a phasing strategy capable of providing a rationale and hierarchy to the provision of infrastructure. As an example, it is possible to propose a logic that begins with a metro station, 1 secondary school, and 1 primary school. This first arrangement can evolve over time, reinforcing the centre with more secondary schools and creating new sub-centres through the provision of primary schools (Fig. 47).

Another important issue to consider is the amount of state interventions needed to both provide

23 Public schools are usually designed for 1,000 students.

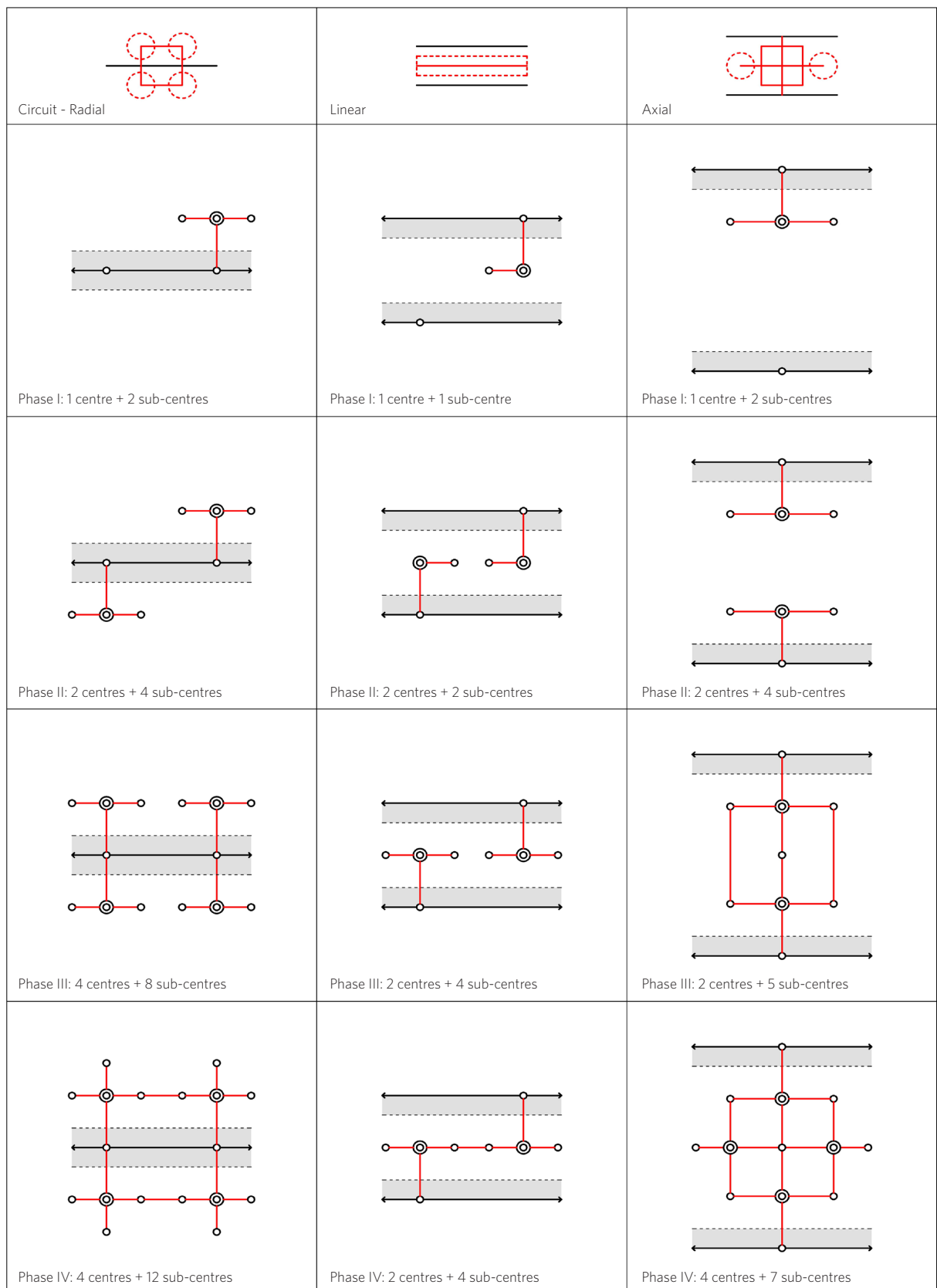
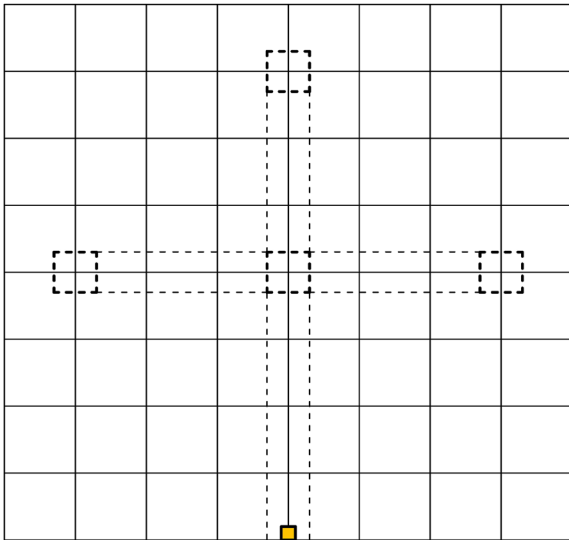


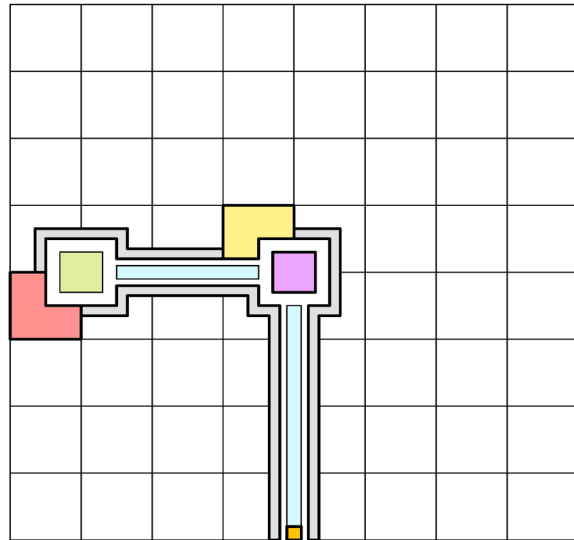
Fig. 46
Proposed general system of hierarchical differentiation of school infrastructures: radial, linear, and axial arrangements.

- Metro Station
- Boulevard
- Commercial Area and Housing
- Health Centre or other Social Service
- Communal Infrastructure
- Secondary School
- Primary School
- Communal Green Area

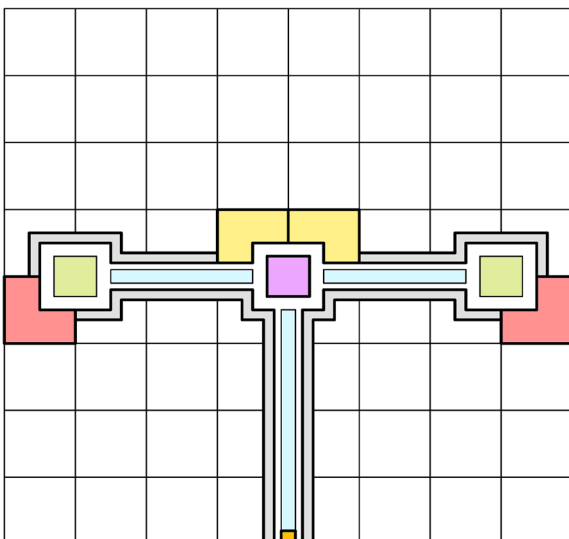
Planning



Phase I



Phase II



Phase III

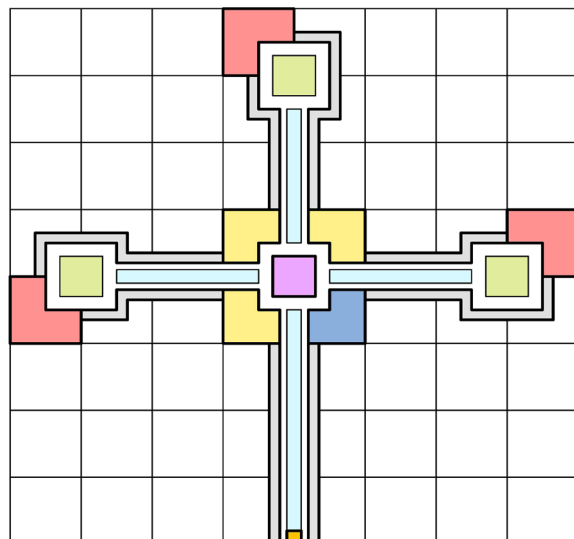
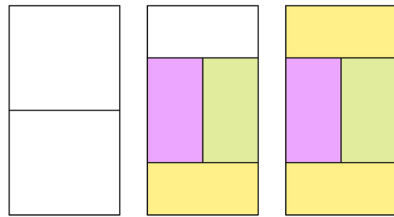


Fig. 47
Proposed sub-system for the arrangement of different infrastructures based on a centre, boulevards, and sub-centres.

- Boulevard
- Commercial Area and Housing
- Health Centre or other Social Service
- Communal Infrastructure
- Secondary School
- Primary School
- Communal Green Area

Arrangement of 2 Blocks of around 100x100 m

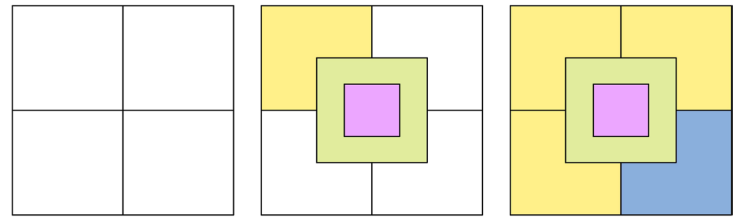


Phase I

Phase II

Phase III

Arrangement of 4 Blocks of around 100x100 m

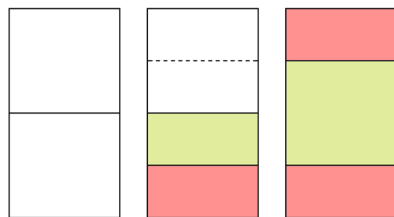


Phase I

Phase II

Fig. 48
Phasing strategies for neighbourhood centres

Arrangement of 2 Blocks of around 100x100 m

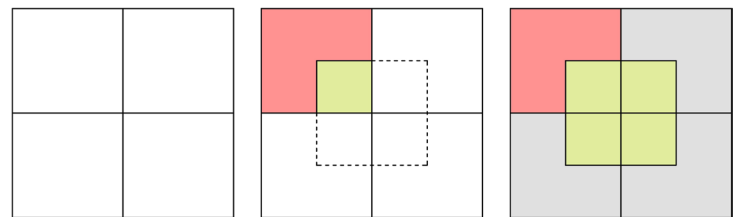


Phase I

Phase II

Phase III

Arrangement of 4 Blocks of around 100x100 m

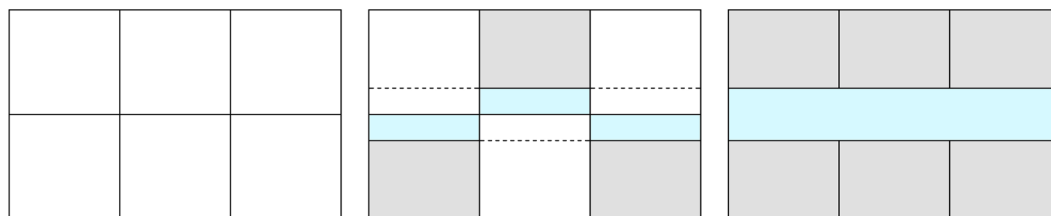


Phase I

Phase II

Fig. 49
Phasing strategies for neighbourhood sub-centres

Arrangement of 6 Blocks of around 100x100 m



Phase I

Phase II

Phase III

Fig. 50
Phasing strategy for boulevards.

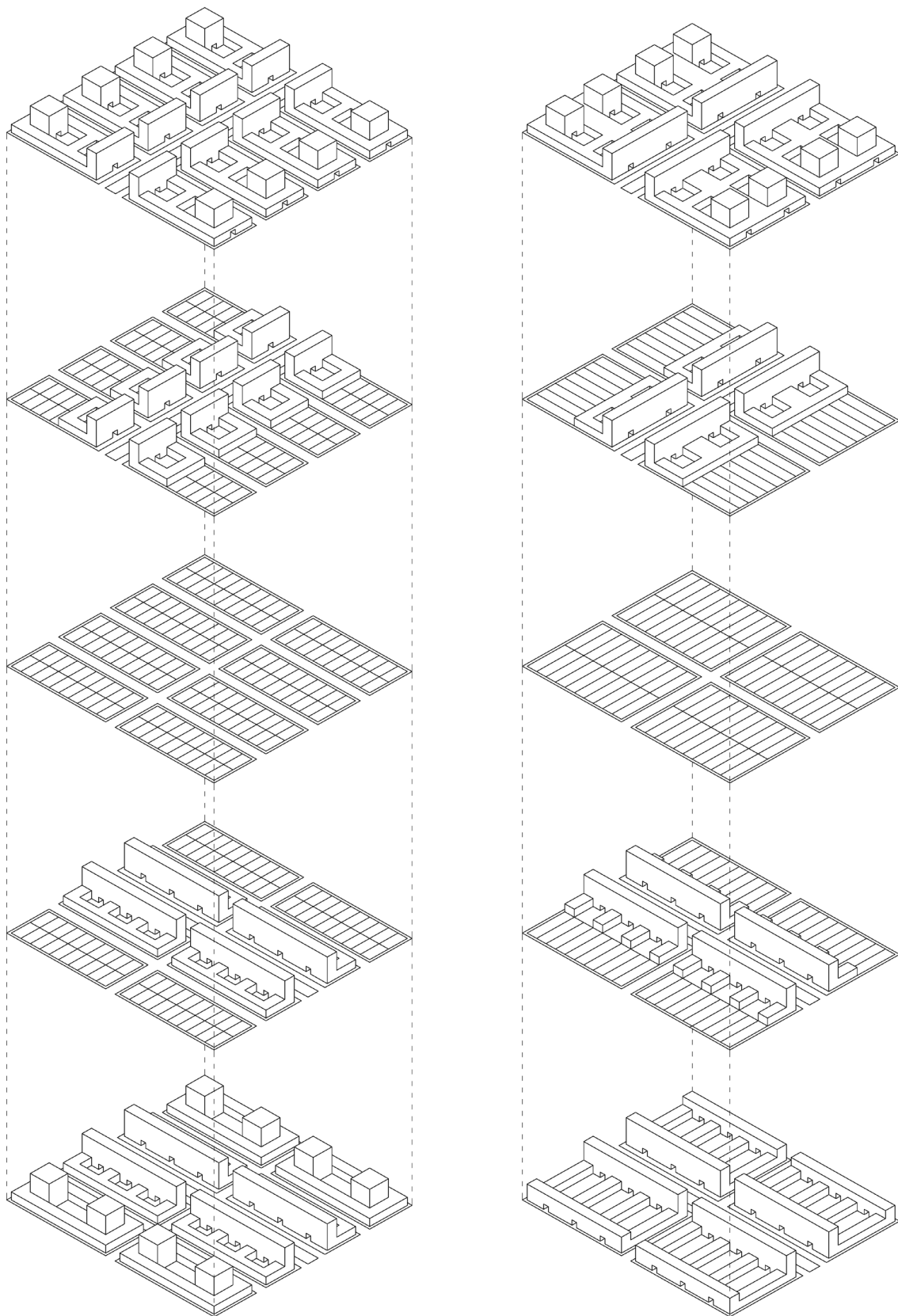


Fig. 51
Phasing strategy for boulevards in blocks of 40x100 and 80x100 meters.

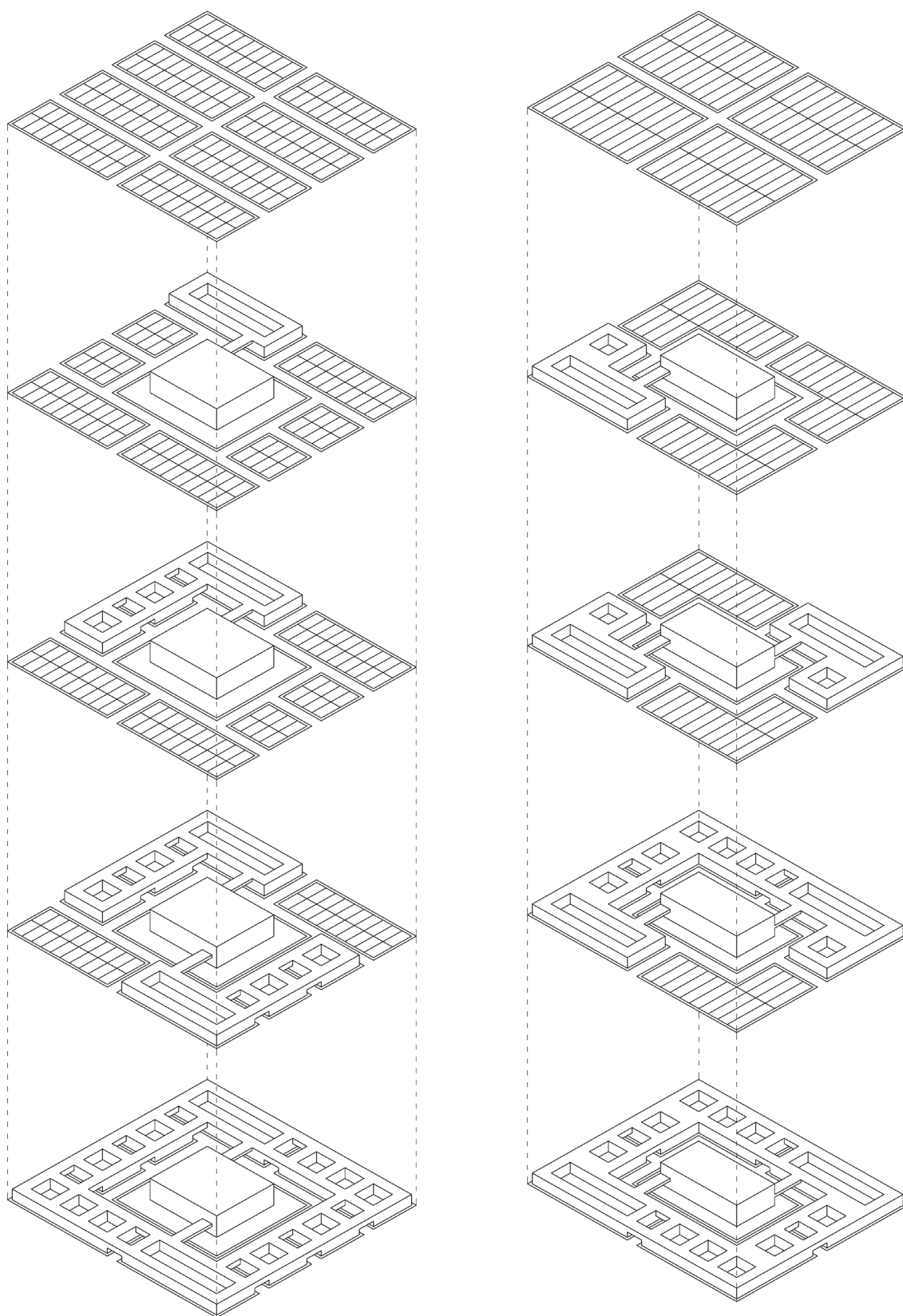


Fig. 52
Phasing strategy for an infrastructural centre in blocks of 40x100 and 80x100 meters.

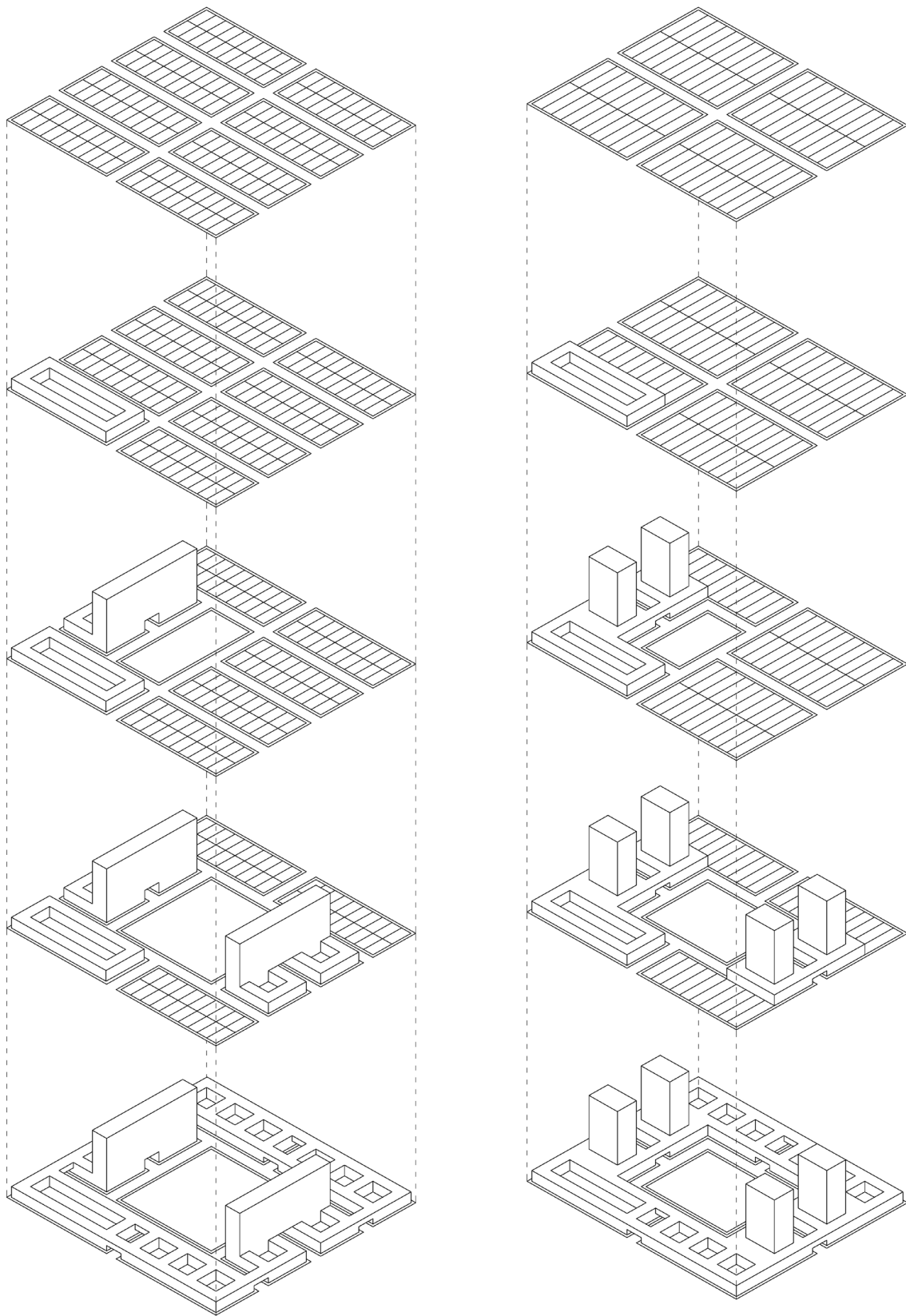


Fig. 53
Phasing strategy for an infrastructural sub-centre in blocks of 40x100 and 80x100 meters.

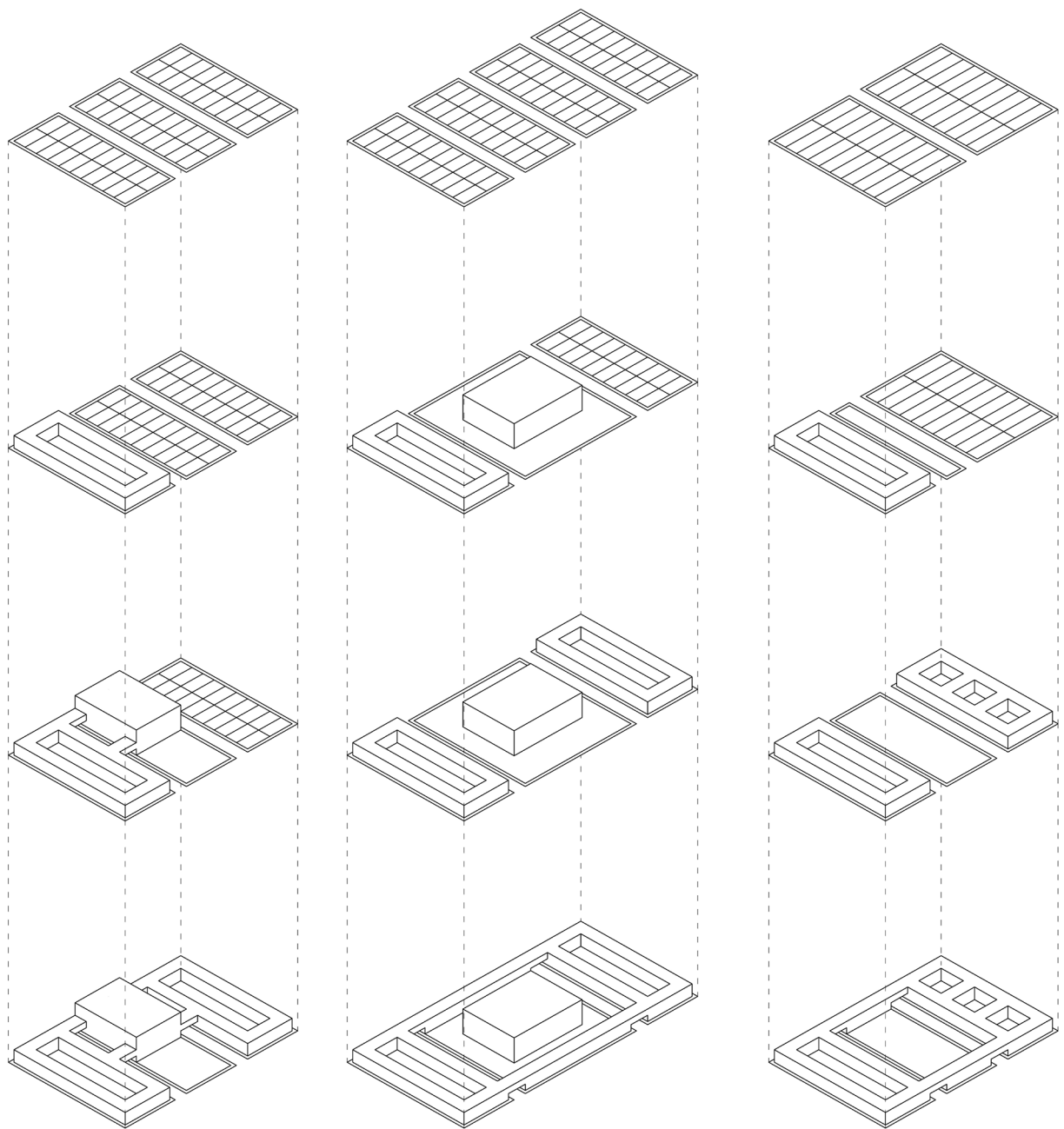


Fig. 54
Phasing strategy for small urban arrangements: 2 centres (left and middle) and 1 sub-centre (right) in blocks of 40x100 meters.

infrastructures and create urban spaces. First of all, a zoning plan that can indicate the areas subject to neighbourhood planning is required. In the case of public schools, the state should buy the required number of plots and thus enable the immediate provision. In the case of boulevards and communal-green areas, the state can implement a system of indirect expropriation (Fig. 48, 49, 50). This means asking private owners to contribute a portion of their plot when new buildings are built. This would require defining priority zones for neighbourhood development and can be achieved through planning instruments – such as the ones related to density levels or building ratios – that either incentivize housing developments within or penalize the ones outside of these areas.

By means of planning instruments, the different urban spaces proposed here should emerge progressively. This requires establishing urban design strategies that can adapt to different plot sizes and create a spatial and functional compatibility among different building types. Thus, apart from the above described planning system for the creation of urban spaces – explained through diagrams – it is also possible to propose a complementary spatial phasing logic according to blocks of 40x100 and 80x100 meters. For boulevards, these are shaped by a continuity of mid- to high-rise building arrangements that in most cases occupy half of the block and define a street width ranging from 30 to 40 meters (Fig. 51). These are highly determined by the orientation of plots, creating either long or short building arrangements. Once the boulevard as such is completed, the second half of the block can be developed, mainly through the combination between row-houses and mid-rises. When it is about neighbourhood centres, these should start with a secondary school and square equipped with infrastructure such as sports halls, theatres and communal centres (Fig. 52). These buildings can then be followed by social services such as social housing or health centres. Then the perimeter can be filled with more schools and other services, creating a continuous mid-rise building that surrounds the infrastructure that concentrates communal and educational programmes. For neighbourhood sub-centres, the process starts with a primary school (Fig. 53). This is followed by housing high-rises – ideally

private housing subject to planning incentives – that give part of their plots to the public administration and create a large communal open green area. The final step is completing the perimeter with mid-rise buildings that can be any form of housing (private, affordable, or social). In addition to the above criteria, both neighbourhood centres and sub-centres can also be developed in smaller arrangements when is required, occupying from 2 to 4 small blocks (Fig. 54).

CONCLUSION

From the Urban Plan to Infrastructural Proliferation Systems

The difficulty of incorporating planning criteria at the neighbourhood scale – which have the challenge of conceiving housing in relation to mid-scale infrastructures – has been determined by an inadequate use of disciplinary tools of architectural and urban design. Instead of being defined as mechanisms to inform principles of design, they have been limited to produce fixed solutions that fail to provide guidance to architects and urban planners. The reason for this is that design approaches based on either examples of good practice or diagrams have understood the neighbourhood as a one-dimensional scale, which results in the prescription of urban plans devoid of generic design strategies. Responding to this problem, a change of focus is proposed. This consists of leaving aside the idea of the urban plan as a number of fixed design decisions in order to set systems of infrastructural proliferation at different scales. Such an approach allows to overcome top down planning strategies – as suggested by the *Housing Manual* and the *SNiP* document – concentrating instead on simultaneous and interconnected urban development processes that can create large and primary infrastructural networks, different types of urban arrangements, and specific building assemblies.

These systems should not be understood as random agglomerations of infrastructures, but need a clear design rationale. Thus, it is required to first define the main design elements of each system, and second, provide a specific spatial and functional hierarchy to the different elements in order to dispose them in the urban space. This is something that housing design guides should clearly address, precisely because of their problems to relate one infrastructure to the other through design strategies. The proposed differentiation of design elements is aligned with the need to distinguish between physical and social infrastructures. Of these, the latter should play a key role in both the general organization of neighbourhoods and setting a rationale for the proliferation of other

infrastructures. The reason for this is that besides ensuring the presence of essential social welfare services associated to housing, social infrastructures can also include physical infrastructures that can be shared with the community. Following this idea, public school education is proposed as a strategic infrastructure in relation to housing, which can include socio-educative, cultural, sports, and leisure facilities.

In addition to the above, the different infrastructural scales that coexist in neighbourhoods cannot be addressed by a single and biased design approach, but require a combination of disciplinary tools that include diagrammatic strategies and examples of good practice. This asks for an agreement between abstract infrastructural proliferation systems and spatial criteria needed to create physically and functionally assembled urban arrangements.

POLICY AND PLANNING



Scalar Limitations

Since the 1970s, the housing design guide ceased to be understood as an independent document and became part of a complex regulatory framework by outlining policies and procedures controlling the overall quality of housing. This is clear looking, firstly, at the different versions of the *Essex Design Guide* (1973, 1997, and 2005). These follow a previously defined large-scale planning context based on local plans and other documents that set design briefs through guidance notes, traffic advisory leaflets, and design bulletins. Secondly, examples such as the *London Housing Design Guide* (2009 and 2010) emphasise the need for a design process capable of producing 'successful' housing solutions. Such a process goes from the inception of the design project to the construction and subsequent performance of the building once inhabited (Fig. 1).

The transformations of the housing design guide can be seen as an attempt to provide a regulatory continuity from abstract policymaking to the various design issues that need to be considered at different scales. However, a problem is that the housing design guide comes into play only once large-scale planning policies are defined; something paradoxical considering that the role of the design guide is to a great extent to define desirable conditions for the provision of housing at all levels. Following is, it is essential to discuss the implications of introducing problems of city planning to the housing design guide. Apart from considering strategies that establish comprehensive relationships between the management of the urban territory and the provision of large-scale infrastructure, it is also necessary to look at the different actors and the regulatory agreements required to implement the proposed transformations.

Urban Sprawl versus Planning

Rethinking the housing design guide in the context

of Santiago, one of the first things to consider is the relationship between housing, neoliberal policymaking, and urban sprawl. In 1973, Chile was a country with a GDP of around £3,000 per capita and over 50% of its population classed as poor. Acknowledging this problem, housing was seen as important to economic growth, by assuming that all income groups had to participate in the economy by paying for housing. That is to say, homeownership became mandatory, independent of the socio-economic circumstances and limitations. As a result, social housing – historically understood as a public service – was changed into low-cost housing, and in the process to an expendable commodity.

To ensure wider access to housing, the state introduced a policy with subsidies for low-income groups. In doing so, once homeownership was achieved, the 'social' housing problem was seen as resolved, relieving the state of the burden of its provision. Housing became a good that had to be attained through savings, but families with limited or no savings could achieve ownership through state subsidies. This created a confusion about the concept of social housing. Although this was technically removed by the neoliberal housing policy, the term 'social housing' is misleadingly used from this policy onwards to refer to low-income housing.

The aim of the policy was a large-scale housing provision that could resolve the historical housing deficit. This, however, was only possible through the creation of Santiago's first urban policy. Ratified in 1979, the policy assumed that land was a readily available commodity. Thus, the land market was deregulated to increase land supply and reduce its cost. The city was expected to grow according to market vitality, which was determined by the ability of people to economically compete and pay for better urban locations (Fig. 2).

One of the main concerns of the new housing policy

The Design Process

The diagram below illustrates the typical responsibilities of the design team, the client team and the planning team in each project stage, linked to the RIBA Plan of Work.

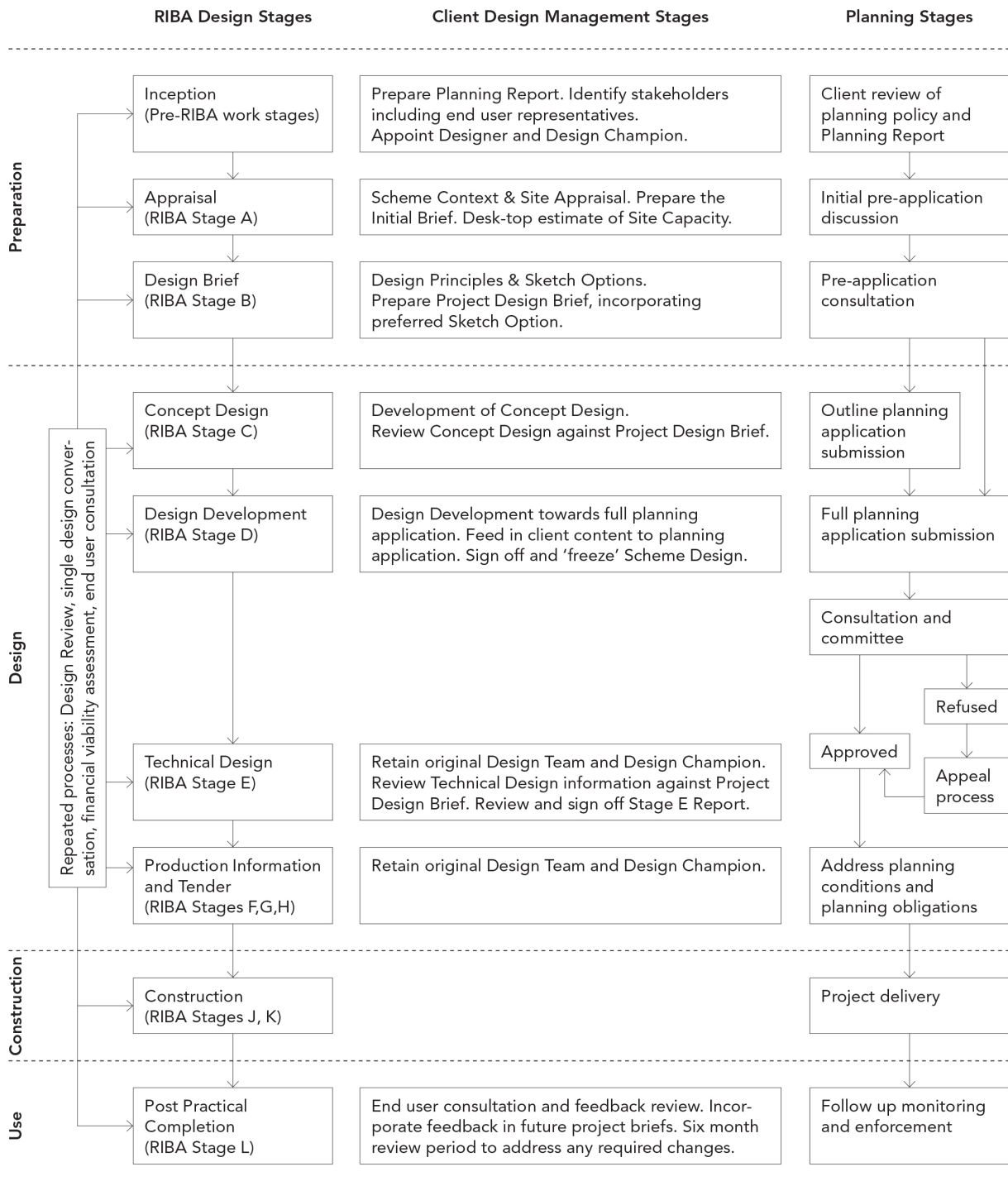


Fig. 1
Diagram of the prescribed design process from the London Housing Design Guide (2010).

was to address the high levels of poverty found in 340 slums spread across Santiago by providing shelter for around 260,000 people.¹ The subsidies were meant to make housing affordable to everyone. However, most mass housing was located in the cheapest and distant areas of Santiago's urban periphery. The lack of urban conditions attached to the provision of subsidies led to the first large-scale crisis in Santiago. It resulted in a totally uncontrolled urban sprawl, almost tripling Santiago's size over a period of five years, and land speculation, making urban development plots unaffordable to low-income groups of population. Responding to this problem, in 1985, the state created a new urban policy that, instead of defining new general principles for urban development, introduced changes based only on technical considerations. First, by establishing a set of specific norms and land uses meant to control the urban sprawl. Second, by creating a clearly defined urban limit for Santiago, which was expected to consolidate over a period of twenty years (Fig. 3).

Despite the housing policy creating a substantial urban transformation in the 1980s, the number of dwellings built during this period – 41,000 houses per year – did not significantly differ to that of previous governments.² In order to fulfil the state's commitment to quickly solve the deficit, the housing policy focused on supply instead of demand, which meant that private developers could largely determine the amount and quality of housing construction. At the same time, the state abolished individual access to subsidies in favour of a collective housing procurement system. This way, an economy of scale could be ensured to private developers. Furthermore, the state's commitment to housing was intensified once democracy was reinstalled in 1990 by increasing the number of subsidy programmes, aiming to solve

the deficit as fast as possible.³

With these changes to housing policy, over a period of fifteen years, the locations of low-income housing were systematically moved to ever more distant and poorer areas of the city known as 'the second periphery'. These are especially found along the southern and western city boundaries, in which 200,000 dwellings were built, representing 10% of Santiago's current housing stock. Despite the effectiveness of the state to reduce the deficit, which dropped from 30% to 12% between 1990 and 2000, the quality of the housing became even more problematic. Besides providing ever smaller dwellings, these were agglomerated in the most segregated areas of the city, which quickly turned into large-scale housing ghettos (Fig. 4).⁴ Their inhabitants were deprived of access to any form of infrastructure, services, and urban facilities, which creates a lifestyle that Alfredo Rodríguez calls 'the poverty of those with roof'.⁵ As Rodríguez states:

The inertia built around the success of the housing policy of the last decades in Chile has hindered a public debate on how to analyse and evaluate all angles of its impact, particularly in relation to the complexity of new urban poverty, to the territorial configuration of a homogeneous concentration of poverty and the costs of maintenance and renovation of segregated cities.⁶

In 2000, seeking to quickly improve the quality of housing provision, the state created yet another

1 Central slums became highly problematic to the development of the real estate market, which did not have the legal rights to evict camp dwellers. Thus, private developers lobbied the state for a policy to eradicate slums. In fact, many camp dwellers resisted eviction from their houses and military force had to be used to remove them.

2 In previous presidential periods, Eduardo Frei Montalva (1964-1970) built an average of 38,000 dwellings per year and Salvador Allende (1970-1973) 43,000.

3 Although restoring democracy presupposed profound changes in the state's commitment to social welfare services, that political episode did not have greater influence on the existing neoliberal model.

4 Atisba, *Guetos en Chile, Noviembre 2010* [Ghettos in Chile, November 2010] (Santiago: Atisba, 2010).

5 Alfredo Rodríguez, Ana Sugranyes, *Los con techo: un desafío para la política de vivienda social* [Those with a roof: a challenge for the social housing policy] (Santiago: Ediciones SUR, 2005).

6 Rodríguez, p. 57 [author's translation from Spanish].

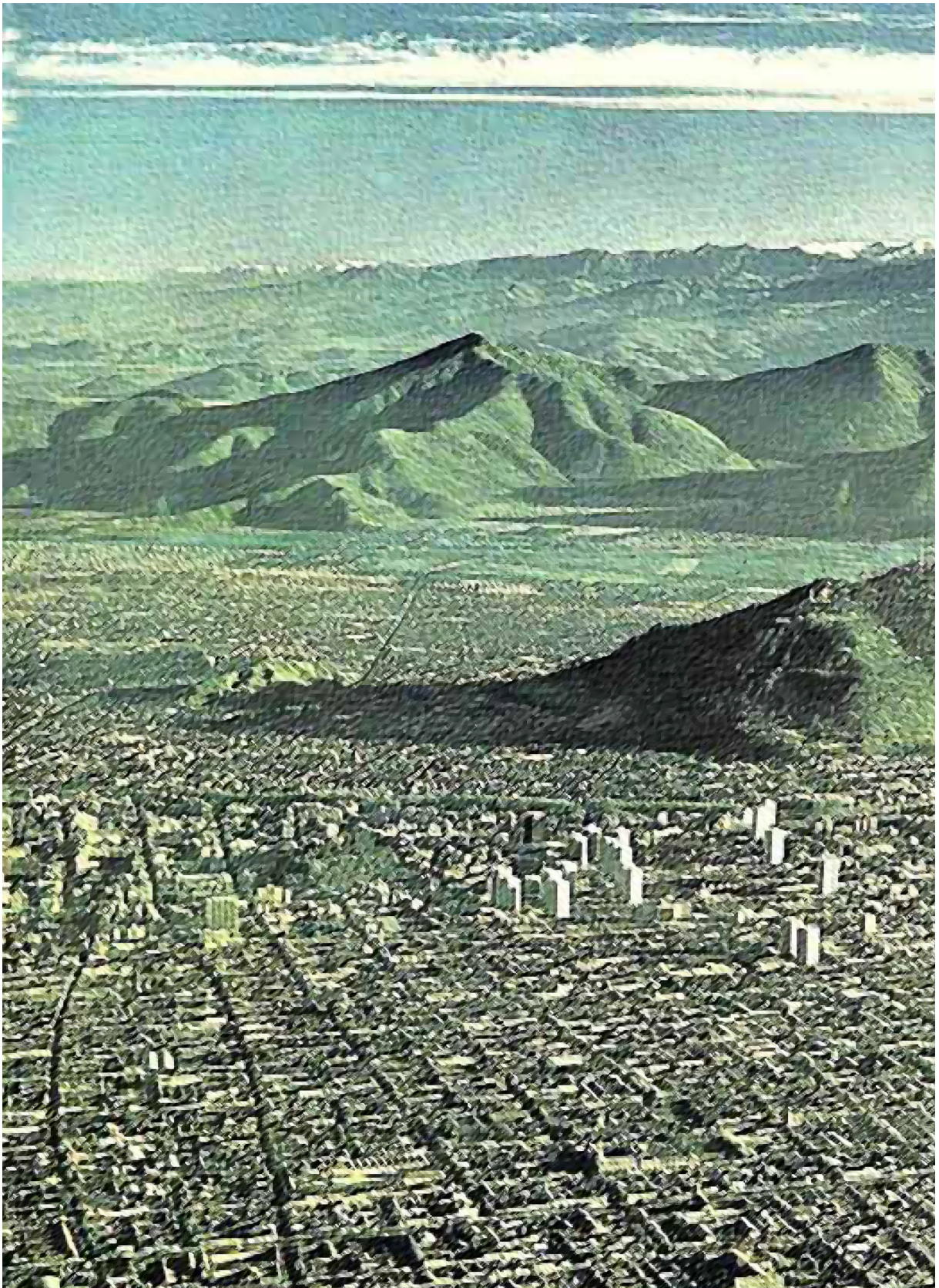


Fig. 2
Aerial view of Santiago before the creation of the first urban policy. Photo by George F. Mobley (National Geographic).

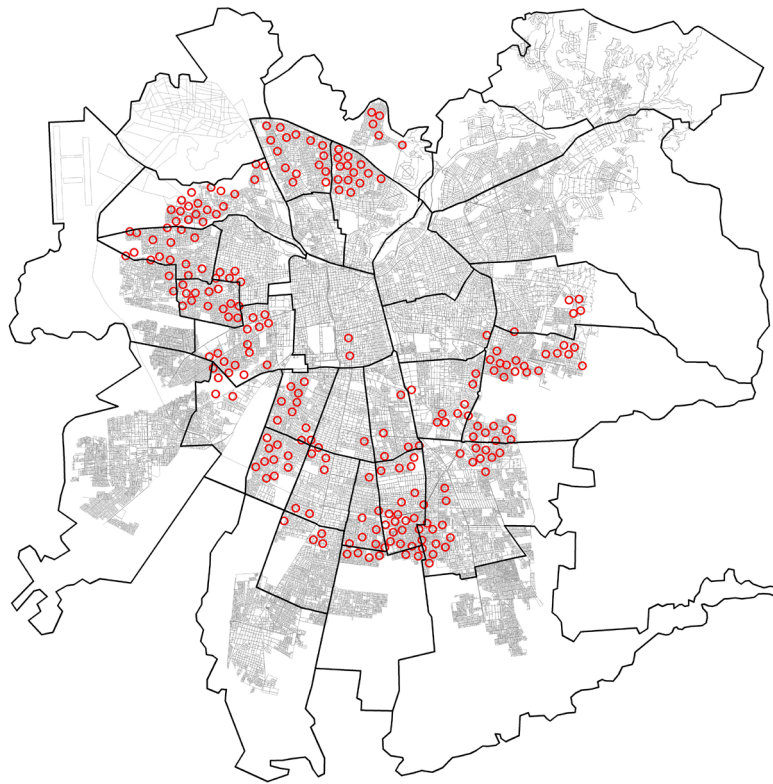


Fig. 3
Location of low-income housing between 1979 and 1989.

housing policy promoting 'growing with equality'.⁷ The policy was expected to pay for larger dwellings and basic services such as electricity, potable water, street lighting, and paved streets. To achieve this, it incorporated a for-profit intermediary stakeholder responsible for coordinating a more complex housing procurement system.⁸ Paradoxically called Social-Real Estate Management Entity (EGIS: Entidades de Gestión Inmobiliaria Social), the first task of this management entity was to consolidate low-income housing demands. Once this is organised and subsidies received, the EGIS performs like any typical private enterprise, having to ensure its profitability and cash flow during the different project phases – starting with the plot purchase to then outsource the design and construction of housing.

⁷ This was precisely the political agenda that led Ricardo Lagos Escobar to become the President of Chile between 2000 and 2006.

⁸ Before creating the EGIS all the subsidies were managed by a state institution called Housing and Urban Services (SERVIU).

Although this new policy increased the requirements attached to the housing provision –for example, more land than before – the progressive urbanisation of Santiago's periphery made the cost of plots unprofitable to EGISs and housing developers. Consequently, Santiago's urban policy was abolished later in 2000. This led to a further extension of the urban limit in 2003, and resulted in a law that permitted the construction of low-income housing in areas outside the city boundaries. This also caused a new expulsion of low-income groups; now at the scale of the Metropolitan Region. Consequently, Santiago underwent a scalar shift from a delimited city to a vast and disjointed one (Fig. 5). Low-income housing became now only feasible in rural settlements and smaller towns located at an average distance of 35 kilometres from the city centre, forcing a commute in a rudimentary bus system of between 4 and 6 hours a day primarily due to the lack of economic activities in these areas. Rodrigo Hidalgo describes the ensuing problem in the following way:

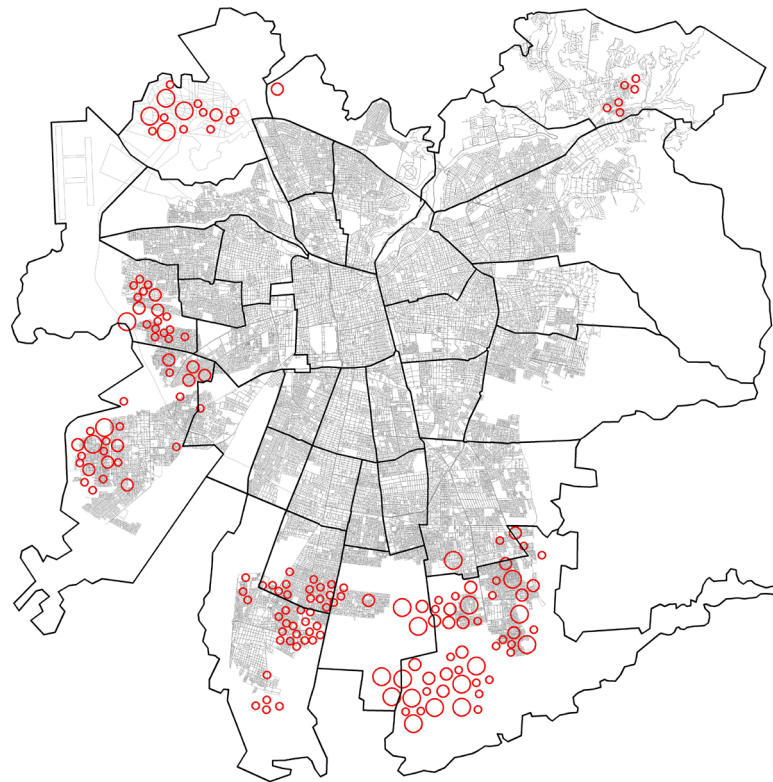


Fig. 4
Location of low-income housing between 1990 and 2000.

The possibility for diverse relationships – physical, scenic, and political, among others – that take place and are effectively practised in a space called the city have been displaced to another situation where they yield to the problems associated with the urban expansion, such as dispersion, polarisation, and fragmentation. [...] We are between two worlds, the city and the urban, where it is possible to find some infrastructure and services, but they lack the essence of the city, that is the diversity and mix of activities and persons.⁹

Supporting this logic of urban sprawl, the state has spent about 5 billion pounds on housing subsidies,

resulting in the construction of 1,5 million dwellings throughout the country. Of these, more than 800,000 units were built in Santiago, representing 40% of its housing stock. According to the OECD's Chilean National Policy Review, between 1976 and 2007 two-thirds of all constructed houses were supported by housing subsidies.¹⁰ The political will to solve the housing deficit is great, and despite social expenditure in Chile being one of the lowest of all OECD countries, public spending on housing is one of the highest in the OECD area. Considering the data, the low-income housing problem seems almost resolved for policymakers. The housing deficit is currently around 12% in Chile (corresponding to

⁹ Rodrigo Hidalgo, '¿Se acabó el suelo en la gran ciudad? Las nuevas periferias metropolitanas de la vivienda social en Santiago de Chile [Is it the land availability in the big city over? The new social housing metropolitan peripheries in Santiago de Chile]', *Revista Eure*, 98 (2007), 57-75 (p.61) [author's translation from Spanish].

¹⁰ Organization for Economic Co-operation and Development, *National Urban Policy Reviews: The Case of Chile - 15th Session of the Working Party on Territorial Policies in Urban Areas*, March 2013.

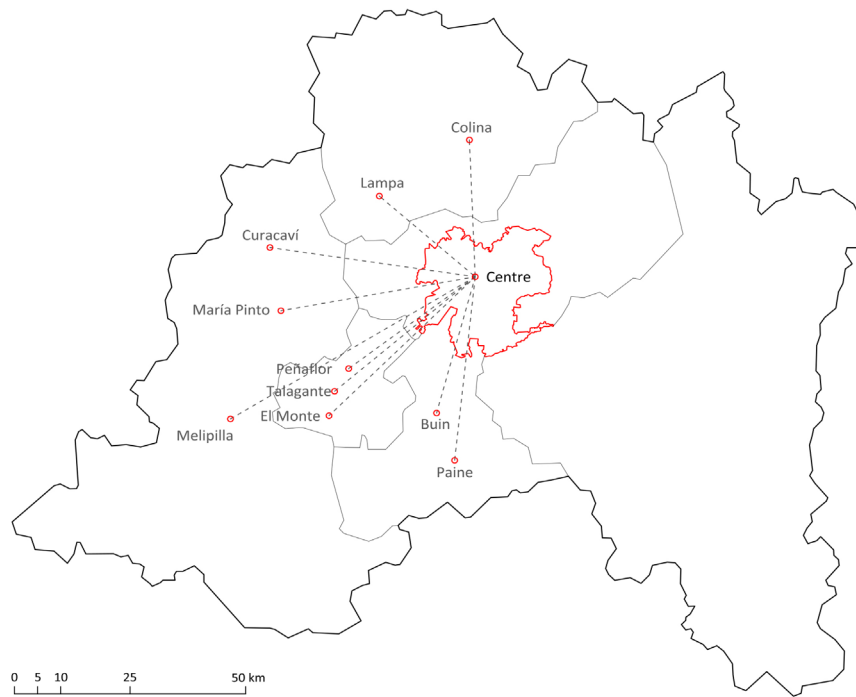


Fig. 5
The metropolitan region and the location of low-income housing between 2000 and 2010.

500,000 houses) and 8% in Santiago.¹¹ In fact, right-wing technocrats expect that the housing deficit will be fully met by 2020.

Technical Reframing

Despite this story of apparent success, the relationship between urban sprawl and low-cost housing causes unexpected problems that have made the current government reconsider the magnitude of the housing deficit. It is now estimated that approximately 200,000 of subsidised dwellings in Santiago will have to be demolished or substantially repaired (Fig. 6).¹² Adding these dwellings to the still remaining deficit, the number of houses that still

have to be built in Santiago equals 400,000 units in reality. According to Pablo Contrucci, current director of the Urban Development Division of the Ministry of Housing and Urbanism, only the cost of re-building existing sub-standard housing projects corresponds to seven subsidies per house.¹³ This shows that the relationship between costs and benefits of housing and urban policies is financially inefficient. Hence, it is necessary to ask for new large-scale planning criteria that are economically as well as socially sustainable in the long-term, and will provide low-income housing in adequately equipped areas of the city.

One strategy to rethink large-scale planning is through an urban densification policy. In relation to this, the former Vice-Minister of Housing and Urbanism (2010-2012) and Minister of Work (2012-2014), Juan Carlos Jobet, believes it will always be more expensive to build housing in central areas

¹¹ Despite the Chilean housing deficit being under 10% in 2009, it increased after the earthquake and tsunami of 27 February 2010. Because of this event, the Chilean government provided around 120,000 new subsidies with the aim of reconstructing the affected houses. According to the OECD, Chile is the only country in Latin America that has systematically reduced its housing deficit.

¹² The reconsidered deficit of housing for the whole country is around 500,000 dwellings.

¹³ Pablo Contrucci was interviewed by the author on April 8, 2014.



Fig. 6
Low-cost housing solutions under demolition in Santiago's periphery. Photo by Televisión Nacional de Chile.

of the city.¹⁴ However, if the side effects of locating people in the periphery – such as those related to security, urban facilities, transport infrastructure, and life quality – are now included in an overall social and economic evaluation the cost of low-income housing becomes much more expensive than it first appears.¹⁵ Thus, a financial breakeven point is needed between housing located in central and distant areas of the city.

The problem with this process of evaluation is that estimating the overall cost of low-income housing would result in questioning the current system of subsidies, thus becoming an obstacle to the primary objective of the reduction of the deficit. However, Jobet argues that if the subsidy budget would vary according to the cost of housing built closer to the

city centre versus the long-term costs of a house built in the periphery, the public expenditure would not differ significantly. In other words, the problem is not the lack of available state funds but their inefficient administration. In fact, despite housing being one of the largest public expenditures, the state always tries to spend as little as possible on social welfare services.¹⁶

Moreover, the state's inability to provide low-income housing within consolidated areas of the city is not only determined by the inefficient administration of public funds. The existing organization and lack of urban design ambitions by the Ministry of Housing and Urbanism contribute to this. The ministry is institutionally divided into two main areas that are totally unrelated. The first is the Urban Development Division (DDU: División de Desarrollo Urbano), in charge of urban-territorial policies, it establishes

¹⁴ Juan Carlos Jobet was interviewed by the author on April 21, 2014.

¹⁵ One of the costs of urban segregation is marginalization. People living in vulnerable social and economic conditions fall, in many cases, in crime, which becomes highly expensive for the state. The cost of a person going to prison is around £8,500 a year, which is half of the amount of a housing subsidy.

¹⁶ This is considering that the Ministry of Housing and Urbanism has an annual budget of around £2 billion, which represents 8% of the Chilean state budget, locating it in the fifth position in the overall budget after education, health, work (retirements), and defence respectively.

norms for city planning, and develops the urban investment plans of the ministry. However, it has very limited powers in terms of urban design and lacks the means to ensure the provision of infrastructure and its spatial relationship with housing and other programmes. The second is the Housing Policy Division (DPH: División de Política Habitacional). Its main focus is the definition of housing policies and standards. The DPH is the main priority of the ministry and usually it is their considerations that force changes to existing urban policies, such as the expansion of Santiago's urban area, in order to ensure a low-income housing supply – which completely relies on cheap development plots. Thus in order to better coordinate city planning and housing provision, it is first necessary to establish a governmental agency capable of producing institutional agreements, not only between the departments of housing and urbanism but also among the different involved ministries, such as those related to transport, infrastructure, and education. The required political objectives should, therefore, derive from an urban densification policy, which enables the coordination among diverse public actors. If these are not incorporated by a comprehensive policy, it is highly unlikely that changes to the existing problems of location and urban design will be effective.

The required densification policy goes, however, against recent technocratic debates. Exemplary for this approach is the book *Santiago: Where we are and where we are going* (2006). This collection of essays is the most recent and exhaustive attempt to defend the implementation of neoliberal housing and urban policies since 1979. According to Alexander Galetovic and Pablo Jordán, although some planning instruments could be improved, there is no clear evidence that shows that Santiago is in crisis.¹⁷ To the contrary, it is seen with optimism because of the following two arguments. The first is that the pessimistic assessment of Santiago's model of urban

development is based on erroneous hypotheses; the main one being related to the critique of urban sprawl and lack of funding for infrastructure in the periphery.¹⁸ Felipe Balmaceda in *Santiago* explains this by saying that private developers assume a financial responsibility for urban sprawl by funding basic infrastructures such as streets, lighting, and sidewalks.¹⁹ The missing infrastructure is paid for by the state, which has the responsibility of ensuring its distribution throughout the periphery. But, what Balmaceda does not consider is that the cost of the missing infrastructure is much greater than the one funded by the private sector and results in insufficient provision in the periphery. One example for this is the cost of extending the underground transport system to the most distant areas of the city. Building only 7 new stations – covering a very limited area in relation to the sprawl of housing developments – is equivalent in its cost to around 1/3 of the currently remaining housing deficit. This means that the cost of bringing this infrastructure to the entire periphery would far exceed the current housing deficit, without even including other required public expenses related to education and health infrastructures. Balmaceda ignores these implications and stresses instead that the main difference between rich and poor areas in Santiago is not infrastructural but the coefficient of green areas per person. This argument is reinforced by Alejandro Aravena, who, in the prologue to *Santiago* states that a straightforward way to improve the urban quality of the periphery is to start greening its sidewalks.²⁰

The second argument in support of neoliberal policymaking is based on the relationship between

17 Alexander Galetovic, Pablo Jordán, 'Santiago: ¿dónde estamos?, ¿hacia dónde vamos? [Santiago: Where are we? Where do we go?]', in *Santiago: Dónde estamos y hacia dónde vamos* [Santiago: Where we are and where we are going], ed. by Alexander Galetovic, (Santiago: Centro de Estudios Públicos, 2006), pp. 25-72.

18 Excluding the six highest income communes of the city, Santiago's density does not fall when the distance to the city core increases, which shows the unequal distribution of capital in the city and a correspondence between poverty and density.

19 Felipe Balmaceda, 'La expansión de Santiago y la hipótesis de la demanda excesiva por infraestructura [The expansion of Santiago and the hypothesis of excessive demand for infrastructure]', in *Santiago: Dónde estamos y hacia dónde vamos* [Santiago: Where we are and where we are going], ed. by Alexander Galetovic, (Santiago: Centro de Estudios Públicos, 2006), pp. 147-175.

20 Alejandro Aravena, 'Prólogo [Prologue]', in *Santiago: Dónde estamos y hacia dónde vamos* [Santiago: Where we are and where we are going], ed. by Alexander Galetovic, (Santiago: Centro de Estudios Públicos, 2006), pp. xv-xxviii.

urban sprawl and lower densities. For Balmaceda, these are inevitable outcomes of the current capitalist process and desirable consequences of economic progress. As incomes increase, people prefer to commute in return for access to more space, which is understood by Balmaceda as a means to achieve a better life quality. That is to say, within a neoliberal policy framework, urban expansion is linked to economic growth, and stopping the urban expansion would prevent social welfare. The expectation is that mid- and high-income groups will drive this process of urban expansion, which will progressively bring to Santiago's periphery the necessary infrastructure that low-income groups cannot pay for themselves.

The apparently desirable process of urban sprawl is also supported by Marcial Echenique. He argues in favour of rebalancing the relationship between housing, infrastructure, and density in Santiago's periphery.²¹ According to Echenique, density has to be understood in relation to average rates of urban sprawl. In comparison to large metropolis such as New York (768,310 ha), Los Angeles (509,130 ha), Tokyo (448,000 ha), Paris (231,085 ha), Boston (230,820 ha), Sao Paulo (203,800 ha), Melbourne (202,698 ha), and London (157,829 ha), Santiago (70,183 ha) is a city considerably less extensive. It can be considered a mid-sized metropolis due to its similarity to cities such as Vancouver (74,115 ha), Copenhagen (59,928 ha) or Madrid (59,700). Nevertheless, Santiago is considerably denser than cities in developed countries. For instance, Santiago (85,1 p/ha) is denser than the average of the 13 densest cities in the United States (14,2 p/ha) and the 11 densest cities in Europe (49,9 p/ha). Santiago is even denser than Asian rich cities such as Tokyo (71 p/ha) but similar to Singapore (86,8 p/ha). Considering average density and looking at its distribution in Santiago, one can observe that the denser areas are the ones located in the periphery.²² Density reaches

up to 150 p/ha in poor and segregated districts such as San Ramón versus 87 p/ha in the city centre.

This reasoning has allowed policymakers to conclude that urban sprawl is not a problem but actually needed. It led to the extension of the urban limit in 2013 (PRMS 100), which increased Santiago's size by 10% through the construction of parks and large residential areas called *Conditioned Urban Development Zones* (ZUC) (Fig. 7).²³ Here, private developers have to fulfil a set of conditions such as the provision of urban facilities, low-income housing rates, and maintenance of green areas. Although for policymakers this is an attempt to increase the quality of the housing provision, ZUC areas are still a problematic urban solution. Despite providing and maintaining infrastructures such as commercial areas and nurseries, this is a suburban model mainly connected by a privatised highway system that forces people to pay for a car (Fig. 8). This shows that urban sprawl and large-scale infrastructural provision prove to be highly imbalanced. The main reason for this is the speed with which sprawl and infrastructure develop, with the former being much faster than the latter (Fig. 9).

Urban Decentralization

Another significant effect of the current process of urban sprawl is the concentration of economic activities in one area of the city. Jorge Rodríguez describes this situation in the following way:

In the case of Santiago's metropolitan area, a remarkable historical specificity is the contrast between residential segregation – whose most notable attribute is the concentration of the highest socioeconomic group in the north-eastern area of Santiago –

21 Marcial Echenique, 'El crecimiento y el desarrollo de las ciudades [Growth and development of cities]', in *Santiago: Dónde estamos y hacia dónde vamos* [Santiago: Where we are and where we are going], ed. by Alexander Galetovic, (Santiago: Centro de Estudios Públicos, 2006), pp. 73-96.

22 This excludes the north-eastern periphery of Santiago, which is the richest and least dense area of the city.

23 Strategies similar to the Conditioned Urban Development were implemented in 1997 (ZODUC) and 2003 (PDUC). However, these did not fulfil the social housing rates defined by the policy due to lacking construction deadlines. Thus, this social housing is still to be built, but will not happen due to lack of incentives and obligations for developers.

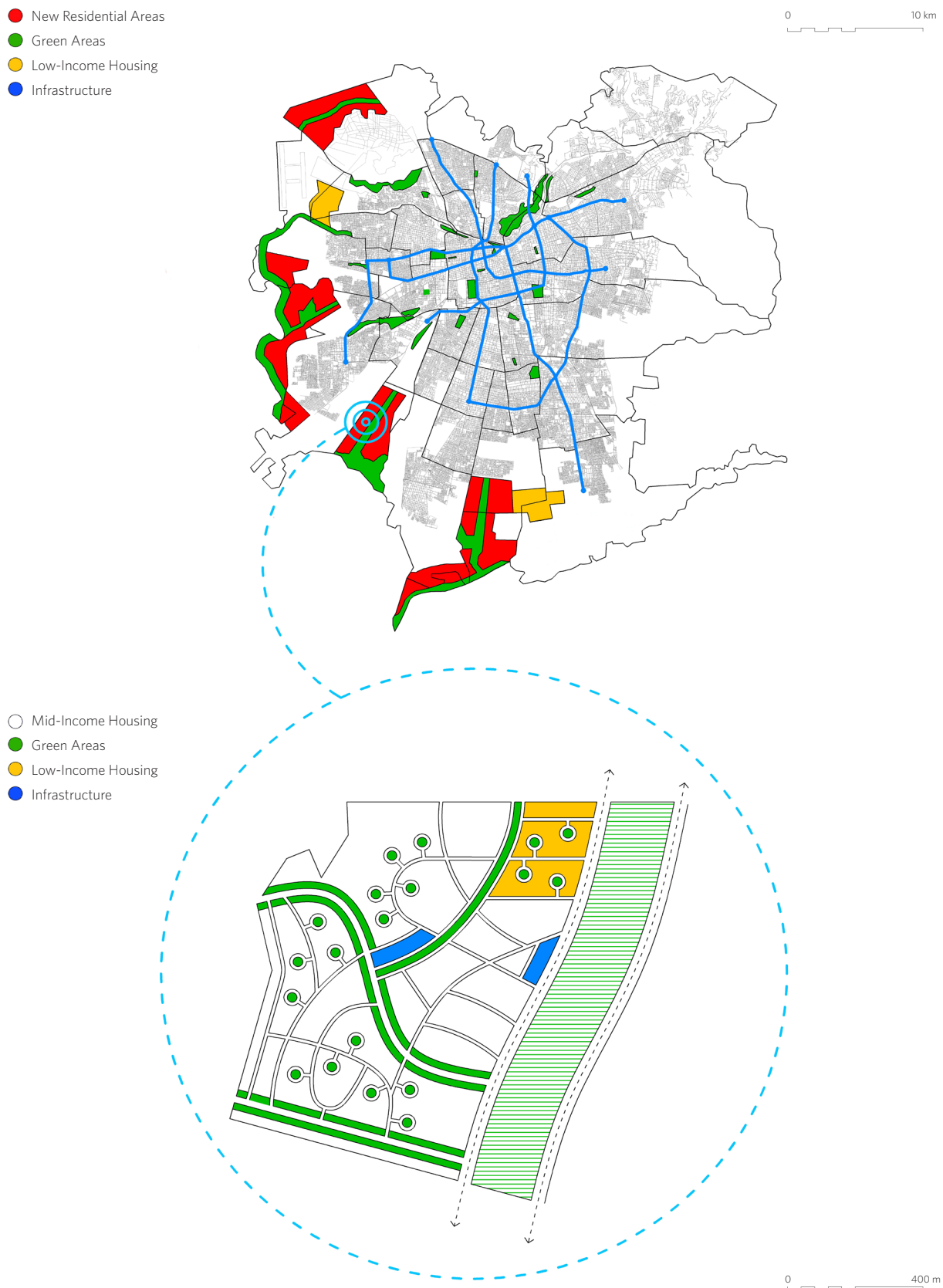


Fig. 7
Above: The PRMS 100 urban extension plan and the lack of connection with the metro transport system (underground and over-ground). Below: Example of layout for new residential areas.



Fig. 8
System of urban highways and segregated residential areas in Santiago's periphery. Photo by Diario la Tercera.

and the daily coexistence among almost all the socioeconomic groups in this area due to its diversity and large demand for jobs.²⁴

For Rodríguez, if the high-income groups were spread throughout the city, a set of associated services and job opportunities would follow.²⁵ However, if grouped in only one area, the outcome is a high concentration of enterprises and jobs. This forces most people belonging to low- and mid-income groups to commute very long distances, resulting in a high demand for the underground transport system.

In response to this problem, some technocrats argue that the advantages of an urban sprawl model driven by mid- to high-income groups – such as the one based on ZUC developments – are the creation of spaces of consumption and services in the periphery, which is seen as the first step in a process of decentralisation.

24 Jorge Rodríguez, '¿Policentrismo o ampliación de la centralidad histórica en el Área Metropolitana del Gran Santiago? Evidencia novedosa proveniente de la encuesta Casen 2009 [Polycentrism or extension of the historical centrality in Big Santiago's Metropolitan Area?] New evidence from the 2009 Casen survey', *Revista Eure*, 114 (2012), 71-97 (p. 95) [author's translation from Spanish].

25 Jorge Rodríguez was interviewed by the author on March 13, 2014.

One current example of this alleged decentralisation is the increasing number of shopping malls (Fig. 10). They concentrate a significant amount of services and are an important source of employment in the periphery. Although during the last decade several shopping malls have been built throughout the periphery, Rodríguez argues that these have no major impact on urban economies. In his words, 'the peripheral demographic expansion creates some degrees of employment dispersion, particularly to satisfy everyday needs (retail, primary health, and primary education, among others). However, it is not obvious that this could be a triggering factor for the metropolitan dispersion of productive activities, such as industries and services.'²⁶ Shopping malls are rather a natural response to a neoliberal housing policy that has operated on a large scale, independent of lacking infrastructure and urban design. Hence, their relative success is given by their ability to bring together a range of functions and activities that were not considered by planning policies.

If shopping malls are a suitable answer to developing the periphery of the city, the problem is that they are

26 Rodríguez, p. 75 [author's translation from Spanish].



Fig. 9
The overground transport system as an infrastructure that develops slower than urban sprawl. Photo by Diario la Tercera.

possible only in areas with mid- to high-consumption capacities. This means that already segregated areas of the city would not benefit from this kind of development. On the contrary, it is necessary to create a number of viable activities. According to Contrucci, even if the state commits to fully equip these areas with primary services like public schools, achieving an effective urban decentralization is mostly determined by a broad proliferation of private secondary services such as banks, commercial areas, and universities. Yet, it is highly unlikely that the periphery will be equipped, unless there are social groups able to pay for those services. This is something difficult to realize, as mid- and high-income groups do not have incentives to move to these areas beyond the affordability of land. In fact, no ZUC project has been built yet, precisely due to the problem of requiring a large mid-income group to make it economically feasible.

Against the expectations of policymakers and technocrats, the few recent examples of decentralization in Santiago did not occur in the far away periphery but in central districts such as Ñuñoa

and Macul, which have experienced an accelerated process of densification over the last decade. Their proximity to the city centre and the north-eastern area has turned them into highly desirable residential districts. Apart from new housing, small-scale economies based on corner shops, restaurants, and workshops have emerged, which meet everyday life needs that go beyond the basic services such as transport and education. Following on this, one can argue that the focus of policymakers and planners should move away from the periphery, concentrating instead on consolidating the undeveloped areas that surround the city centre. Although many of these are already connected to the underground system, the range of other infrastructures is very limited. There are mainly primary infrastructures (such as schools, primary health centres, and police stations), but little secondary (commercial and productive) and tertiary ones (cultural, civic, and leisure). Hence, the required densification policy should explicitly require developing these areas as a first priority, with the aim of both relocating low-income groups within the city and to think housing in relation to a broad



Fig. 10
Example of a shopping mall in Santiago's periphery. Photo by Patricio Rubio.

range of infrastructures – as happens with Ñuñoa and Macul – ultimately creating a new model of urban development.

In addition the above described economic, functional, and spatial manifestations of urban segregation, it is also necessary to stress that there are other forms of exclusion, which have to do with problems of social and ethnic discrimination. These are based, for example, in problems of perception and acceptance of social groups that are considered different because of their culture, race, colour, ethnicity, and national origin, among others. However, although this problem is important, it is not a main topic in the development of the thesis, which is focused on problems of design.

Regulatory Means, Stakeholders, and Processes

Besides the need of comprehensive policymaking, including low-income groups within urban processes also requires the production of a regulatory framework

–that can ensure the engagement and support of the state to the right to housing and the city.²⁷ Once this comes into place, the state has to define a long-term strategy capable of bringing together the provision of housing and infrastructure through a General Plan of Urban Development (Fig. 11, 12). The proposed plan can be conceived in three phases. The first considers the short- to mid-term operations and consists in the transformation of areas close to the existing underground network. The funds currently allocated to building infrastructures in the periphery can then be used to finance missing infrastructures in central areas, such as educational and health facilities, civic centres, and green areas. The second part proposes an expansion of the underground transport system to central but still unconnected areas of the city.

²⁷ The Chilean Constitution does not state anything about the right to housing and the city. However, this can be achieved by modifying the current constitution – something highly unlikely to happen due to the high parliamentary support that this requires – or by including it in a new constitution, which is one of the central projects of the current government in power.

The third and last part concerns with the urban consolidation of these areas through the provision of missing infrastructures, which would allow creating a compact, adequately equipped, and highly connected city.

With the political ambition and the General Plan of Urban Development already defined, it is necessary to ask for the model, instruments, actors and institutional arrangements required. In relation to the model, Luis Eduardo Bresciani, chairman of the recently created National Board of Urban Development and former director of the Urban Development Division of the Ministry of Housing and Urbanism (2003-2010), argues that one way is by continuing on the basis of the current system.²⁸ This is by creating financial and regulatory incentives for the market, whether these are in the form of subsidies, planning exemptions, or tax breaks. It means defining strict technical requirements and design guidelines. However, one of the main problems that this model has had is that the provision is subject to the profitability by developers. When this is not high enough, the state is forced to decrease its standards to guarantee the continuation of the provision of housing, if at a lower quality. The opposite way is to define a model of provision through direct state involvement. Although not subject to external pressure, the problem of this approach is that the public sector has difficulties to coordinate and sustain housing provision on a large scale.

But Bresciani suggests that instead of choosing between these two models, a mixed and more flexible system can be established. This means outsourcing the housing provision with direct state involvement when the private sector fails to meet the housing demand. Even though Bresciani does not distinguish between social and affordable housing – limiting the discussion to a problem of provision instead of defining housing as a social service that requires a set of coordinated social policies – he argues in favour of expanding the means through which it is possible to realize a sufficient amount of housing. But the central point is that homeownership is not the only answer

to this problem. He calls for a leasing system that can be run in parallel by the state and private developers, thereby increasing the housing supply. Thus, whatever is the modality adopted, it is the state that defines the expected outcomes of provision, for which it requires to put into action a range of policy instruments.²⁹

Along this line of thinking, the National Board of Urban Development is asking for a ‘stick-and-carrot’ approach (control versus incentives) through taxes on the sale of large plots, minimum low-income housing rates per district, control of land price speculation in ‘areas of social interest’, and through defining plots subject to purchase by the state. At the same time, private developers can be encouraged to participate in the housing provision through incentives that allow higher densities, heights, and built ratios, among others.³⁰

Setting a broader range of policy instruments also means defining a more coordinated process of provision. This requires incorporating new public stakeholders and administrative bodies at different scales. The process should start in the Central Government and the Ministry of Housing and Urbanism. These have the task of putting together the Urban Densification Policy (abstract criteria) with the General Plan of Urban Development (concrete criteria). This will define general welfare requirements and specific planning strategies. The Policy and Plan should not be understood as fixed but continuously assessed by an external board, whose main task should be ensuring the compatibility of both instruments. Although the National Board of Urban Development could fulfil this function as its

29 Until now, the state has mainly relied on financial incentives (subsidies) that are in fact administrative instruments. By doing that, the state has avoided asking for legislative support that allows introducing stronger instruments for planning.

30 These are mainly proposals by Miguel Lawner, executive director of the Housing and Urban Improvement Corporation (CORMU) during the government of Salvador Allende, a period in which the concept of social housing was recognized by a clear public commitment to social service and the state’s provision of quality housing. Its inclusion to the National Board of Urban Development manifests a change in recent discussions – mainly based on policies to mitigate the impact of the neoliberal housing and urban management model – and requiring from the state to take on a key role in the housing provision.

28 Luis Eduardo Bresciani was interviewed by the author on March 19, 2014.

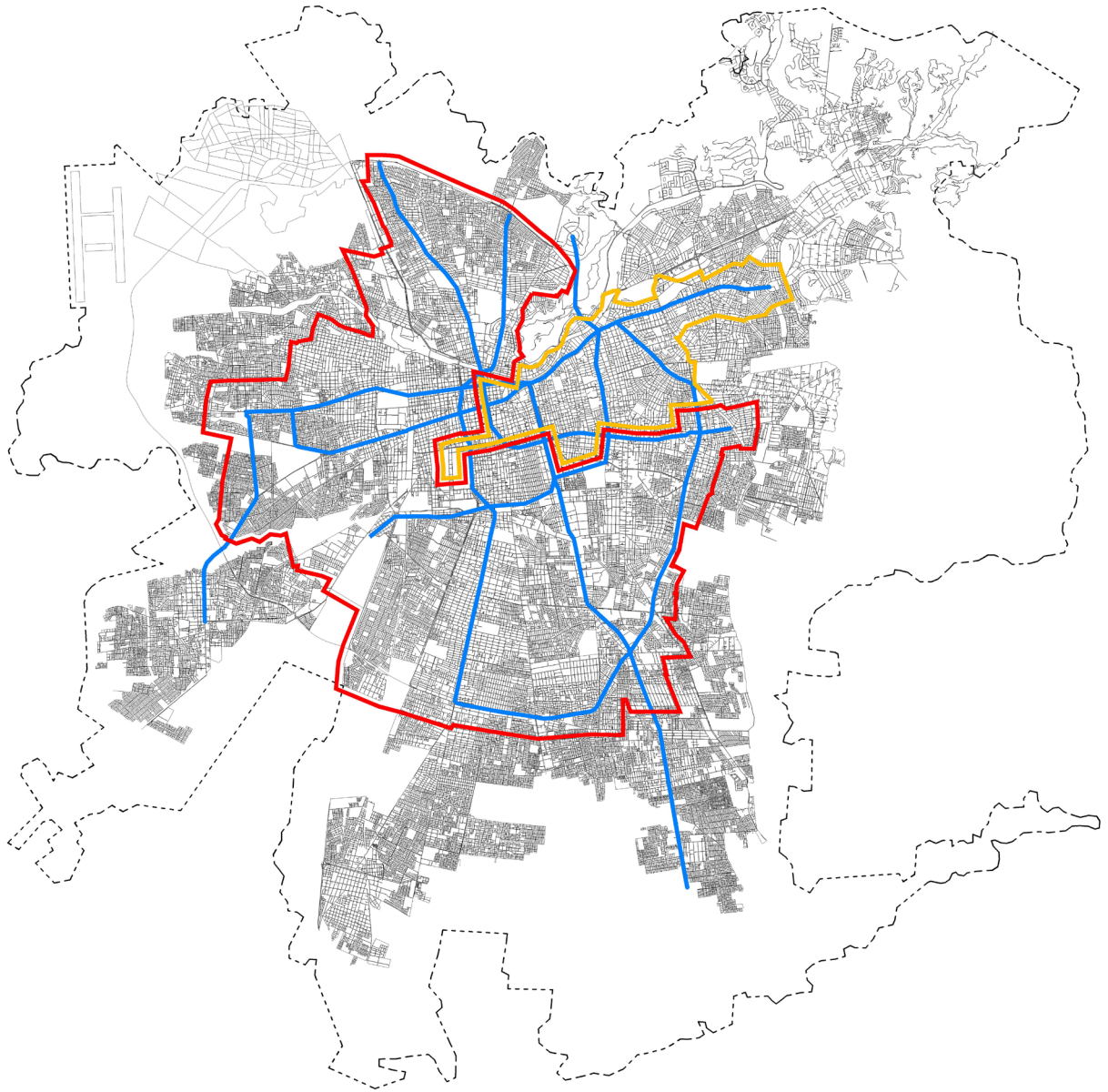


Fig. 11
Area subject to the General Plan of Urban Development and the already consolidated north-eastern area of Santiago.

main task is assessing the overall quality of the policy framework, the problem with this actor is that it only concerns with abstract criteria. Most of its members are policymakers, ministers, and people belonging to disciplines that have nothing to do with problems of architectural and urban design.³¹ In fact, only 6 out of 26 members are architects, of which only half have experience in designing. Such imbalanced boards would hardly understand the design agencies of the housing design guide, which defines the expected outcomes at the different scales involved. Thus, if the particular board are to participate in the assessment of the housing design guide, that would require a different composition of specialists.

Once this framework is defined, the General Plan can be implemented at four different levels. The first is the Metropolitan Government, which organises the territory at a regional scale. Its main duty is the demarcation and coordination of cities and rural areas through large scale planning (Regional Plan). This controls urban sprawl and considers, among others, an inter-city transport system.

The next administrative body is the City Government (provincial scale), whose main responsibility is the general management of urban territory and the coordination among municipalities. This administrative body does not currently exist in Santiago.³² Unlike the rest of the self-governing provinces that comprise the Metropolitan Region, Santiago's Province is administratively divided into 32 autonomous districts, which hinders establishing plans that require their joint coordination.³³ The City Government should, therefore, be responsible for enforcing the proposed General Plan of Urban Development. This stipulates the areas subject to

both infrastructural reinforcement and densification, which should go hand in hand with the development of the underground transport system.

The third level is that of the Municipality, whose obligation is to administrate a commune and answer to local needs. This oversees a Local Plan that specifies the areas, blocks or plots to develop in relation to missing social infrastructures. The municipality level is fundamental to the implementation of the General Plan, due to its capacity to bring forth action principles of urban design and drive housing procurement. On the one hand, the planning department of the municipality has to define density levels in relation to provided public infrastructures. The latter have to be strategically located in relation to housing and the pre-existing conditions of chosen areas. On the other, the municipality is responsible for orchestrating public and private funds in order to build social, affordable or private housing either separately or by combining them in different ways (social-affordable, social-private, affordable-private, social-affordable-private), which would create a hybrid tenure system. This means making use of different policy instruments to, first, make plots affordable and, second, incentivize, control, and manage the different stakeholders involved in the process of housing provision.

The fourth and final level is the housing department. This can be run by the municipality in cooperation with other associated state departments belonging, for example, to the Ministry of Housing and Urbanism, the Ministry of Health, and the Ministry of Social Development. Its main responsibility should be processing and answering the demand for social or affordable housing – depending on the case – and deal with associated operational issues such as maintenance problems, security, programmes of social surveillance, among others.

31 The members of this board include representatives of the government (ministers and high public bureaucrats), legislative body (senators and deputies), academia (architecture schools), Chilean Association of Architects, the real estate sector, and architects renowned for their contribution to the development of the country.

32 Creating a city government is an idea supported by the recently released National Policy of Urban Development (2013). However, until now no major plans, policy instruments or new administrative bodies have been implemented.

33 Each province is provided with a government that coordinates its inner districts.

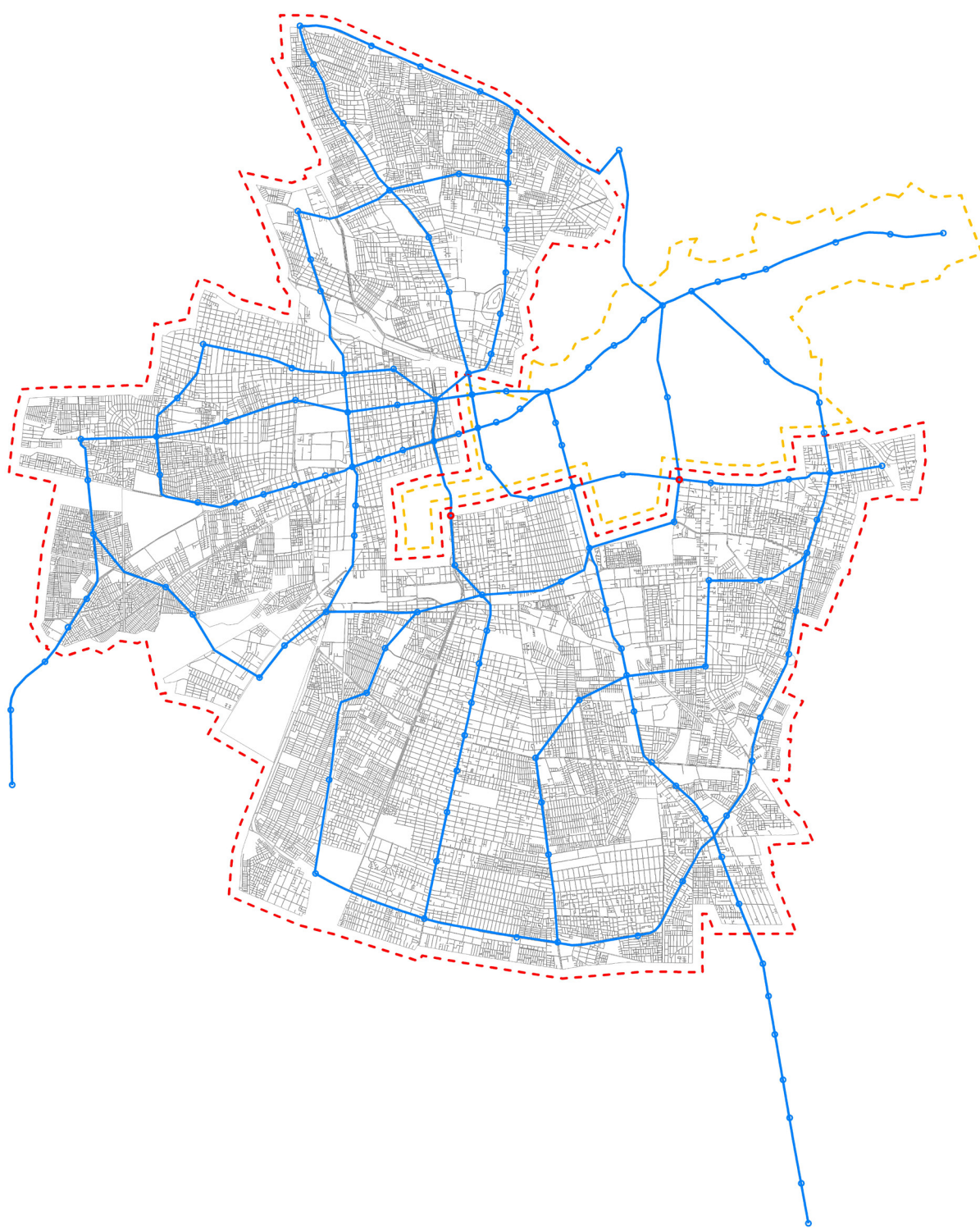


Fig. 12
General Plan of Urban Development.

CONCLUSION

Disciplinary Expansion

Housing design guides have progressively responded to complex regulatory frameworks by including policies and design procedures. This has been an attempt to strengthen the housing design guide as an instrument that cannot be understood by itself but only in a larger context, providing a regulatory continuity from abstract and broad political concerns to the concrete outcomes of housing design and urban provision. Such a transformation is, however, insufficient when considering the regulatory context of Santiago. The lack of planning criteria for housing and urban policies has resulted in an uncontrolled process of urban sprawl that is not in line with existing plans of infrastructural development nor with strategies that could bring them together in the long term. Based on this problem, what has been proposed here is a scalar expansion of the housing design guide, aiming at providing guidance not only at the scale of the dwelling, building and block, and neighbourhood, but also of the city, which is something that has been unconsidered by this regulatory instrument so far.

Besides providing criteria for large-scale planning through a number of plans that exemplify possible relationships between areas of urban development and public transport infrastructure – asking the housing design guide to include a broader range of disciplinary tools of urban design – an administrative and regulatory structure capable of implementing the suggested planning strategy is also necessary. This structure requires other kind of criteria, which relates to the need to include strategies for the coordination of the different scales of territorial management and multiple public stakeholders responsible for the city planning and the model of provision. The need to envision an articulated network of actors is therefore understood as a disciplinary expansion of the housing design guide. From this transformation, it can be argued that a housing design guide is able to include not only factual processes – as the system of design assessment proposed by the *London Housing Design Guide* – but also conceptual ones, and in doing so,

the challenge of the housing design guide is twofold: to provide directions of good practice to architects, developers, and planners, and to become a strategic means for both structuring the state apparatus and comprehensive policymaking. The latter is possible by accounting for a number of interrelated design problems that need a regulatory grounding. That is to say, expanding the scope of the housing design guide means asking for a number of policy instruments capable of ensuring the necessary conditions for the provision and administration of housing and its associated infrastructures. In these terms, the housing design guide can not only inform policymaking, but also set forward an argument for the scope of design itself.

CONCLUSION

The question of how to think housing in social terms has been framed under the need of creating a policy of broad scope that has to be able to respond to fundamentally different forms of housing. This leads to ask the state to assume a clear responsibility for the welfare of vulnerable social groups by ensuring access to housing and the city. As discussed throughout the thesis, assuming this responsibility has to do with the creation of a system of housing provision in which the state actively deals with problems of planning, funding, tenures (ownership), management, and performance (standards of provision), among others. Dealing with all of these problems at the same time is essential in order to overcome a model that has proven to be socially and economically unsustainable. This is by focusing only on the provision of large amounts of dwellings, leaving aside what should be understood as the core concern of housing, which is the creation of domestic environments where physical and social needs can be answered, ultimately ensuring a lifestyle of cultural and economic development to individuals.

While including these problems becomes essential to break with a housing model that does not recognize social differences, it can be argued that if all the required transformations to the housing policy are based only on precepts of quantitative efficiency, the call for a more comprehensive approach to housing provision is at risk of failure. The main reason for this is that social needs could be mistakenly addressed through a number of discrete considerations – asking, for example, for generous dwelling space standards, large flats, proximity to parking and public spaces, infrastructures of all kinds, and connectivity with the metro network, among others – understanding the housing provision as nothing more than a list of requirements to fulfil, without reflecting on how they need to be treated and assembled. This way, even if the state commits to both increase the number of regulatory instruments and a greater public spending, housing can continue being a technical

problem driven by a smarter technocracy that can hardly cross the threshold of planning and abstract policymaking. Thus, it is necessary to address these problems through a different paradigm; one capable of following precepts of qualitative efficiency. This means that the different aspects and requirements of the housing provision need to be thought in relation to issues that are not subject to be standardized, such as those related to principles of architectural and urban design.

In response, the thesis has explored the housing design guide as a means to introduce qualitative concerns. This is by framing social problems through questions of design, which are specifically addressed by looking at the relationship between housing and infrastructure from the dwelling to the city. In this scalar progression, the thesis has reflected on the importance of social infrastructures, which are understood as strategic mechanisms for the provision of welfare by promoting socio-educational practices in private, communal, and public domains. It has been proposed that the relationship between housing and social infrastructures starts at the scale of the dwelling through a communal facility that complements and makes possible a minimum dwelling programme. This is followed by a spatial framework that organizes and expands the communal facility, developing simultaneously at the interior and exterior of the block through different urban patterns – systems of streets and voids – thus creating a basis for urban design. The next social infrastructures are public schools. Besides responding to a basic social welfare service that plays a key role in the formation of an inclusive political community, public schools are able to spatially and functionally organize a variety of other mid-scale infrastructures and social services needed on a daily basis within neighbourhoods. Finally, the last infrastructure is that of transport. Although transport can be defined as a physical infrastructure, when this is adequately provided, it

can have significant implications in the provision of social welfare. This means that large-scale planning and transport infrastructure need to be thought together in order to strategically administrate the urban territory.

By focusing on these infrastructures and other interrelated housing problems at different scales, the housing design guide ceases to be understood as a socially neutral design instrument, becoming a mechanism to bring qualitative considerations to the problem of housing provision. This is possible by framing problems through multiple design strategies, which are addressed and illustrated through a broad range of disciplinary tools of architectural and urban design. These strategies are therefore an attempt to overcome prescriptive approaches to design, aiming to define criteria and design systems instead of fixed solutions. In doing so, the focus is not on the creation of a single and efficient plan, but on the qualitative relationship among design elements, which can produce multiple assemblies that at the same time can become elements for the creation of larger arrangements, being this another argument for the methodological approach to the thesis that addressed design problems from the micro scale to the large scale. The broad range of scales that are addressed in the thesis is also understood as an argument to expand the disciplinary scopes of the housing design guide. This expansion is particularly critical in relation to planning problems, asking to provide design criteria not only through plans but also by suggesting relationships among stakeholders, policy instruments, and processes. This way, the housing design guide becomes a powerful instrument to inform policymaking, which should not be understood as a purely abstract mechanism anymore.

In addition to the above, and as discussed in the introduction of the thesis, the housing design guide deals with both theoretical and practical issues at the same time, referring to and providing different forms of knowledges to audiences with different interests. In regards to a theoretical agenda, there is, as the thesis argues, a need for creating a design document that is ultimately a statement for a social welfare agenda. Such statement and agenda are subject to continuous discussion – with policymakers and experts from

different disciplines – and modified over time, which makes the design guide a means of reflecting on the system of provision itself. The theoretical focus of the thesis thus was on the possibility to rethink through the design guide the concept of minimum provision as a political project that recognizes the social and scalar dimensions of the housing problem, no longer targeting only the most disadvantaged income groups, but an entire social spectrum and the city as a whole. This rethinking of the ‘minimum’ is only possible through a broader understanding of the notion of the ‘normal’, which responds in a versatile manner to socially specific needs. In terms of the complementary issues of design, the guide is an attempt to approach these questions through a number of generic design strategies at different scales that can account for the magnitude of the problem of provision. In this way, the main conceptual effort of a housing design guide should be making all theoretical and practical strategies coexist, by bringing them together in a coherent and interrelated design system. Based on this, although the design guide is a developed summary of the design aspects of the thesis and specific to the context of Santiago de Chile, it is possible to argue that the proposed design system is, due to its grounding in broader theoretical and disciplinary contexts and knowledge, partially generic and, consequently, can be applied to other urban contexts or cities.

At the same time, with regard to problems of practice, the housing design guide is mainly addressed at architects, housing developers, and urban planners; each one focused on a limited range of scales. That is to say, not all the sections of the guide become useful to all audiences when dealing with problems of practice. This, however, is not an argument for understanding each scale in isolation, but provides an important reason to reinforce the design relationships between contiguous scales. This means that one scale determines the architectural and urban conditions of the following one and vice versa. In relation to this problem, the ‘example’ plays a fundamental role in making explicit how different design elements become compatible in specific urban contexts in order to create housing and infrastructural assemblies. Thus, the example is not only that which follows after a diagrammatic definition, but also the strategic means

to think design problems comprehensively, breaking challenging purely technical design guidance.

With the design approach, scope of guidance, audience, and qualitative ambitions defined in this thesis, a question that remains for discussion is how to implement the design guide. Although this problem was not addressed, one can ask whether the design guide, together with all of its implications, can be implemented in its totality or in parts. This means asking about how much of it needs to be implemented in order to remain an operative design system, and how to gain support for this implementation? These questions return to the initial motivation of the thesis, which was the creation of a design framework that incorporates social, functional, morphological, and spatial concerns without the necessity of a fully defined plan. With this in mind, what is proposed here is not intended to be the example of an ideal housing design guide but the deployment and expansion of the multiple design problems addressed in the thesis through a range of disciplinary tools belonging to architectural and urban design. To do so, the guide's structure is reverse from that of the thesis, developing from the large scale to the small scale. The main reason for this being that when defining the general system and problems of social housing provision, one must understand the supporting regulatory structure, associated large scale planning policies, and the network of actors that the housing design guide relies on in order to become operative.

**A
HOUSING
DESIGN
GUIDE
FOR
SANTIAGO
DE
CHILE**

DESIGN COMPONENT

CONTENTS

Part I

POLICY AND PLANNING	204
---------------------	-----

Part II

NEIGHBOURHOOD	220
---------------	-----

Part III

BUILDING AND BLOCK	250
--------------------	-----

Part IV

DWELLING	292
----------	-----

Part V

INTER-SCALAR RELATIONSHIPS	314
----------------------------	-----

POLICY AND PLANNING

1

The existing policy framework for housing has been mainly concerned with answering a historical deficit; a problem that has been addressed through low-cost housing subsidies that support a market self-regulation and the general access to homeownership (private housing). This logic understands **the provision of housing and infrastructure as two different problems and results in a large-scale proliferation of physically and socially segregated suburban settlements**. Although new residential areas have been recently required to include the provision of basic mid-scale infrastructure such as schools and commercial areas, they remain disconnected from the city's major and centrally located infrastructures. Moreover, the development of suburban areas is greater and faster than that of infrastructure, which perpetuates an inefficient circle of urban sprawl in the short term, and expensive but insufficient investments in infrastructure in the long term. The outcome is therefore an urban development model that segregates low-income groups. The main reason for this being insufficient access to the city and its multiple opportunities, which has a direct impact on their social, economic, and cultural development.

In order to address the above described problems, policymaking and planning should be based on the following concerns:

- The creation of long-term functional residential areas that can deliver social welfare through the provision of housing and its associated physical and social infrastructures.
- Conceiving connected and fully equipped areas that promotes the coexistence of different income groups, including those in vulnerable socioeconomic conditions.
- To expand the scope of the current housing policy, which means providing a range of fundamentally different forms of housing (private housing, affordable housing, and social housing).
- To create a comprehensive policy framework capable of including a greater number of regulatory instruments and public stakeholders responsible for the provision of housing and its associated infrastructures.

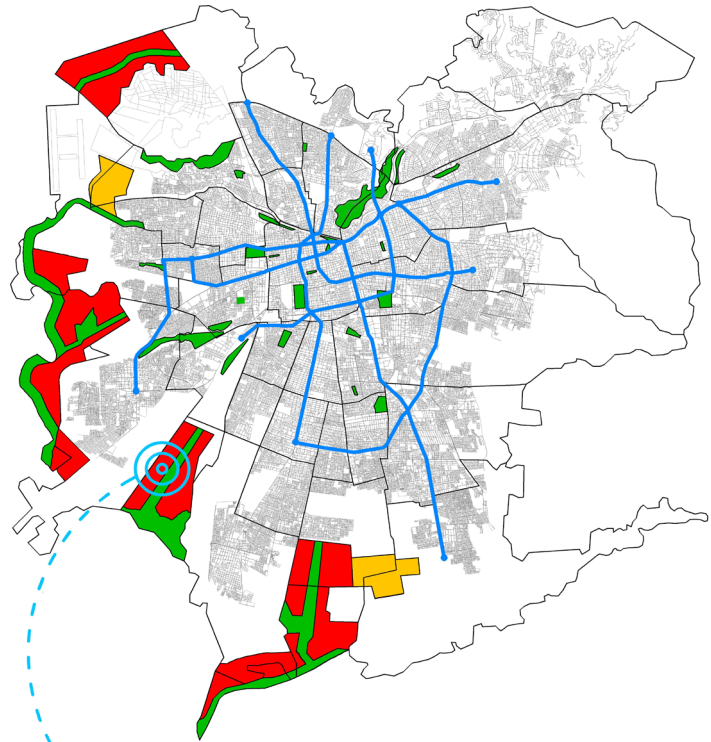
The development of suburban areas is greater and faster than that of infrastructure, which perpetuates an inefficient circle of urban sprawl in the short term, and expensive but insufficient investments in infrastructure in the long term.

- New Residential Areas
- Green Areas
- Low-Income Housing
- Infrastructure

0 10 km

Urban extension plan of Santiago:

New residential developments are provided with large green areas but deprived of access to public transport infrastructure. This makes the city accessible to only those who can pay for cars and the use of privatized highways.



- Mid-Income Housing
- Green Areas
- Low-Income Housing
- Infrastructure

Example of residential area:

New housing developments are currently mainly conceived as suburban settlements that are expected to include ratios of low-income housing, green areas, and basic infrastructure (schools and shops). The latter is seriously lacking and unable to recreate the multiple opportunities that the consolidated city offers, such as jobs, education, cultural diversity, and leisure, among others.

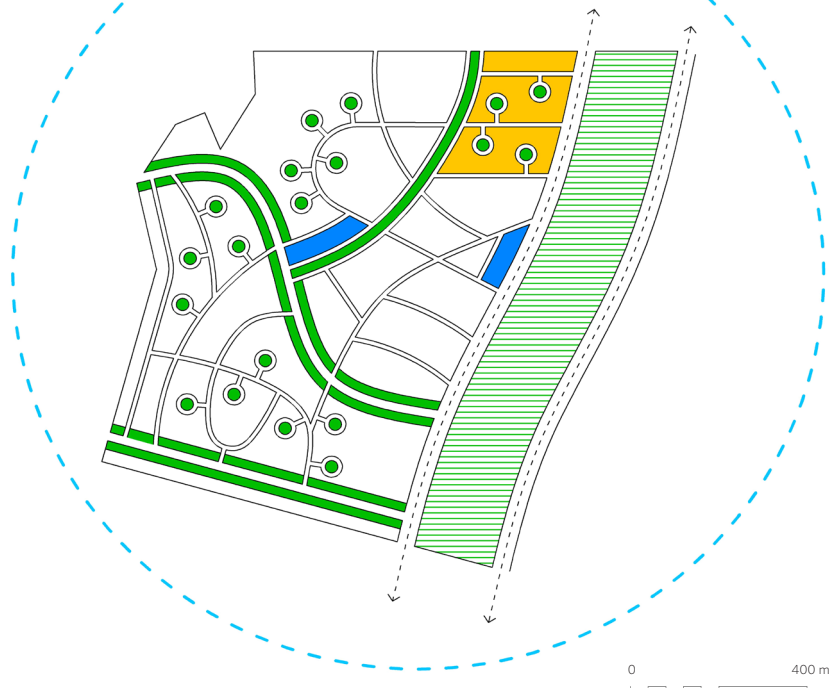


Fig. 1.1

Urban sprawls versus infrastructural development: current urban extension plan of Santiago and its suburban areas.

Regulatory Base:

To include low-income groups within urban processes, it is first necessary to create a constitutional base that can establish a commitment by the state to support the right to housing and the city. Once this is defined, **the state has to determine an Urban Densification Policy capable of bringing together the provision of housing and infrastructure.**

Urban Development:

The strategy presented here aims to overcome the current problem of urban sprawl created by low-cost housing at the urban periphery. Instead of insisting on the horizontal expansion of the city, policymaking has to **reinforce and densify areas with good access to urban core infrastructures, which is highly dependent on the metro transport system.** Even though some central areas have a high level of urban development – most central and north-eastern areas of the city – many other areas have been poorly planned. In order to address this problem, a significant part of the city has to be rethought through a **General Plan of Urban Development.**

Design Criteria:

The General Plan of Urban Development is conceived in 3 phases, which are the following:

- **Phase 1** (short- to mid-term): reinforcement of areas close to the existing metro network. This means reallocating the funds spent on building infrastructure in the periphery to pay for complementary infrastructure in central areas. These can be education and health facilities, civic centres, leisure centres, and green spaces, among others.
- **Phase 2** (mid-term): expansion of the metro transport system to central but still unconnected areas of the city.
- **Phase 3** (long-term): overall consolidation of central areas of the city and the definition of 4 large districts (norther, southern, eastern, and western). These should include a broad range of infrastructures of different scales, ultimately creating a compact, fully equipped, and highly connected city.

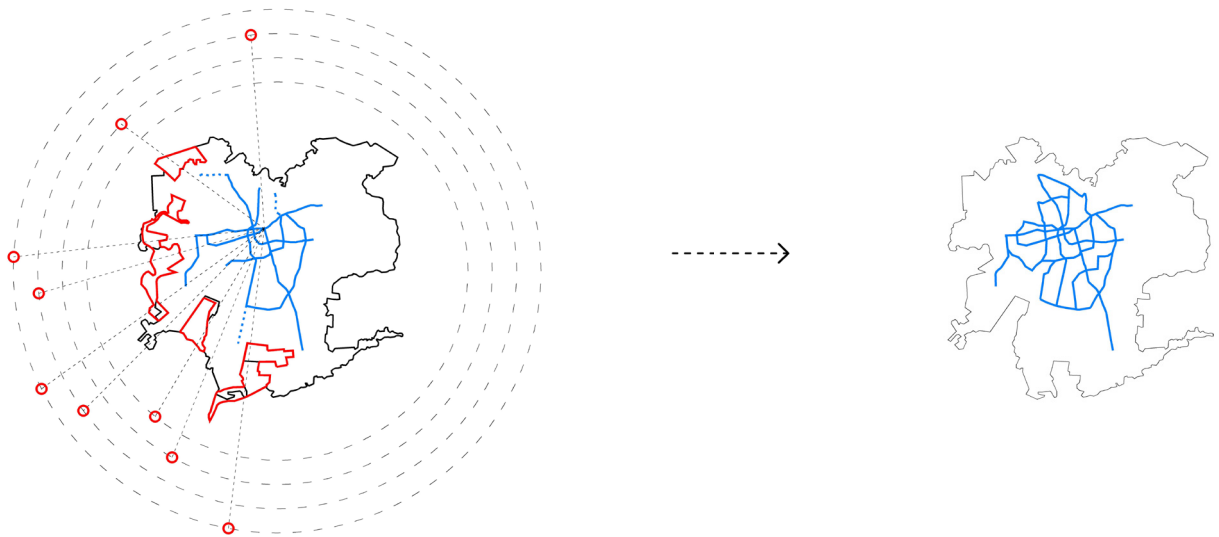


Fig. 1.2
Proposed transformation from an urban sprawl model (developing inside and outside of the city boundaries) to an infrastructural reinforcement model.

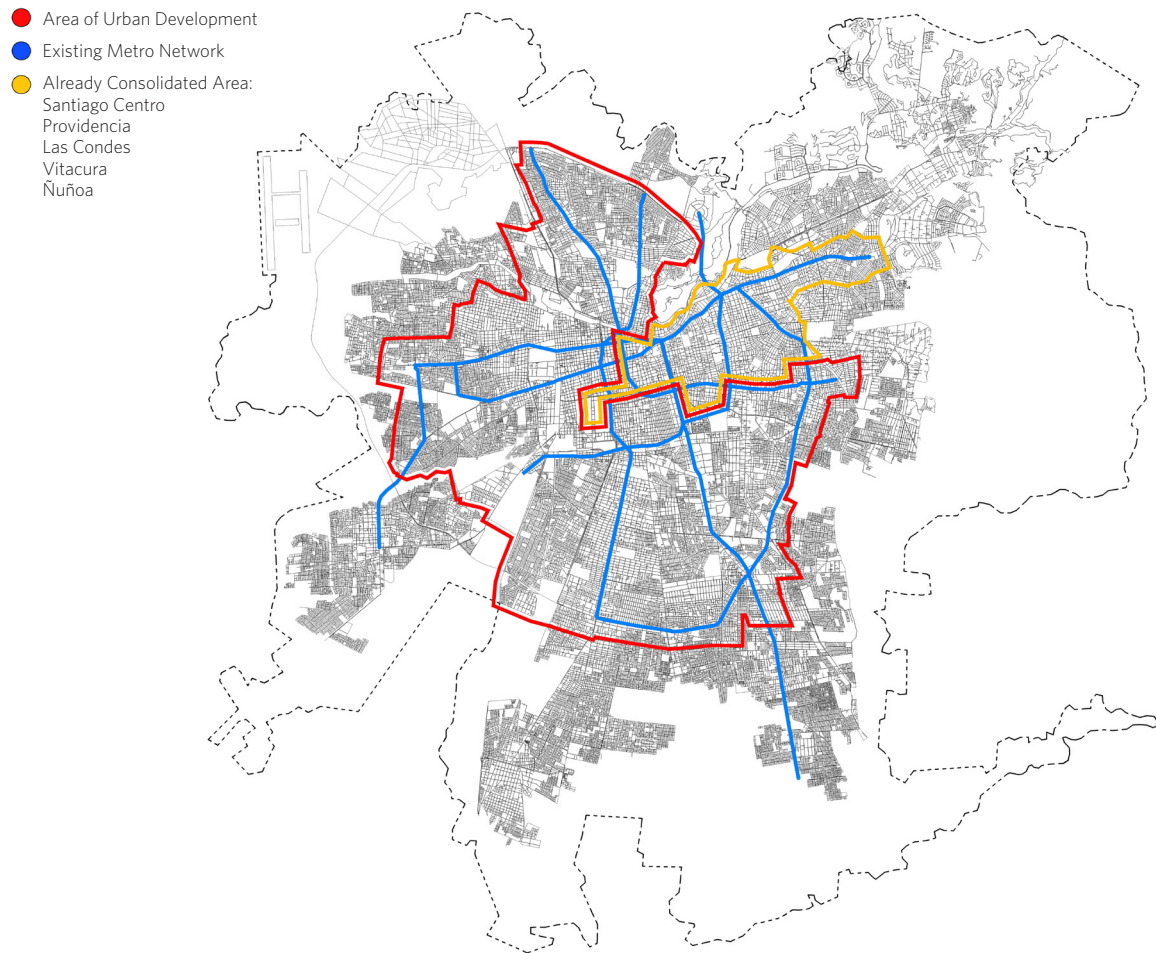
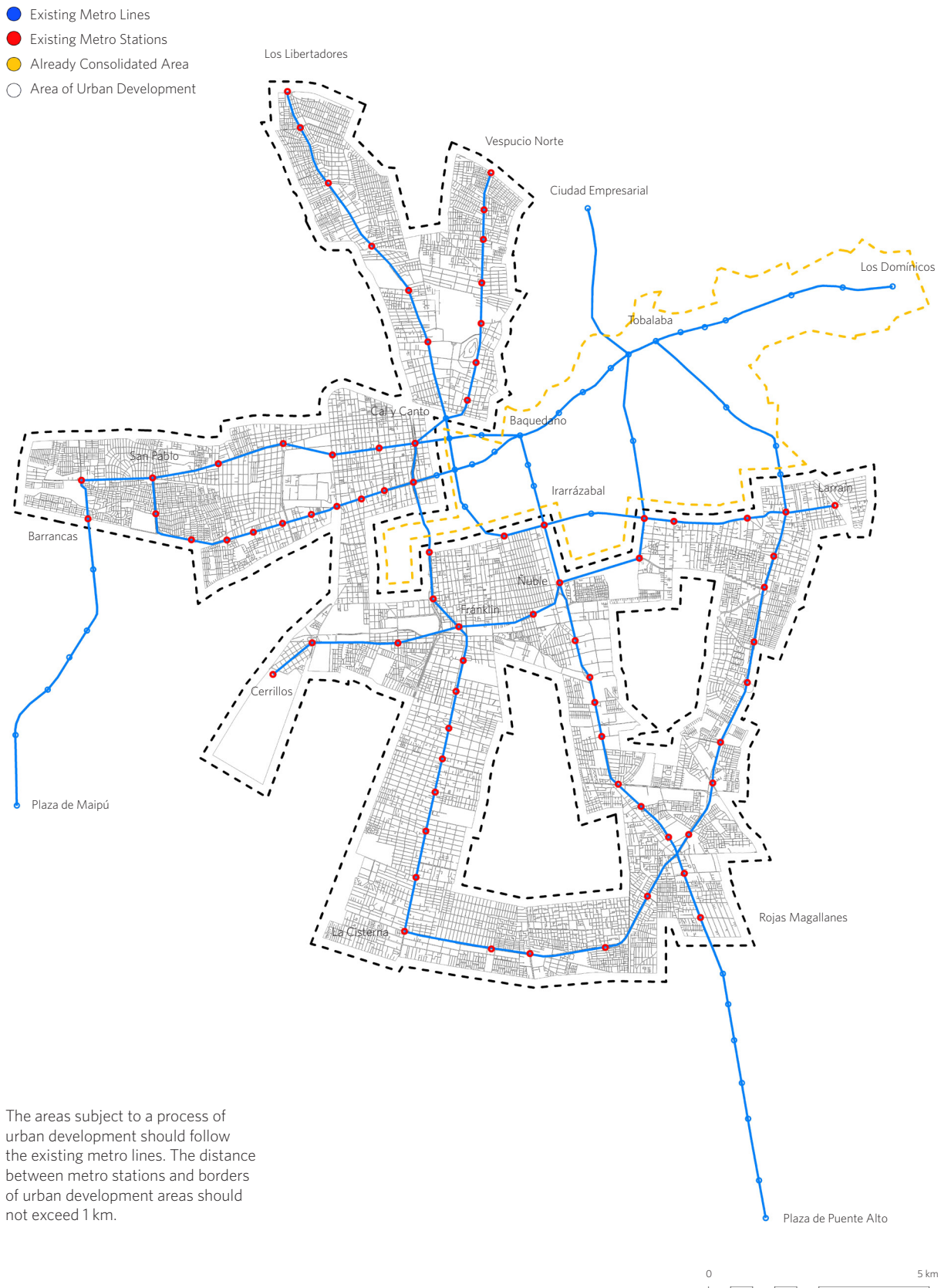


Fig. 1.3
Area subject to the General Plan of Urban Development and the north-eastern area.



The areas subject to a process of urban development should follow the existing metro lines. The distance between metro stations and borders of urban development areas should not exceed 1 km.

Fig. 1.4
General Plan of Urban Development / Phase I: reinforcement of areas close to the metro network.

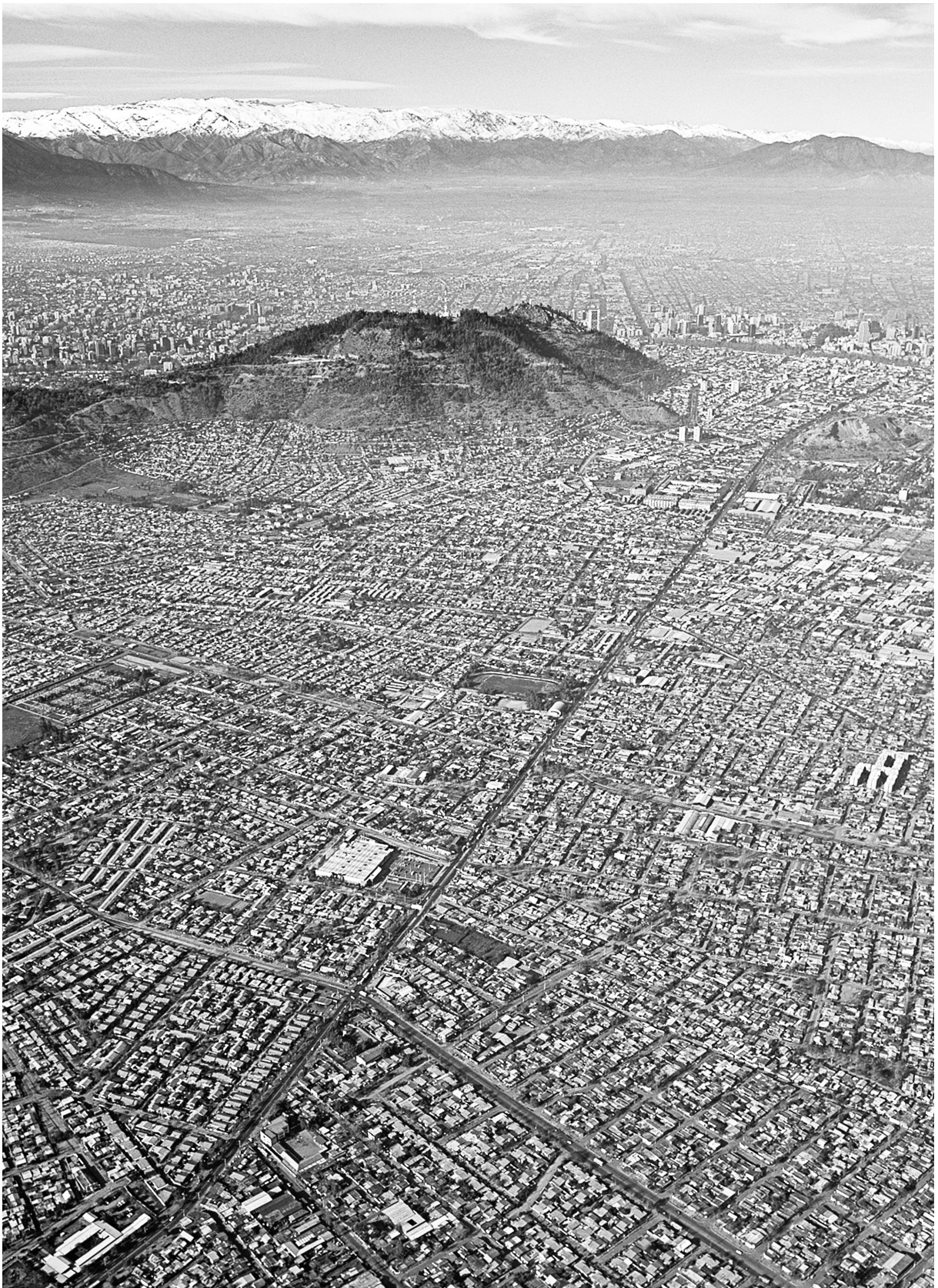
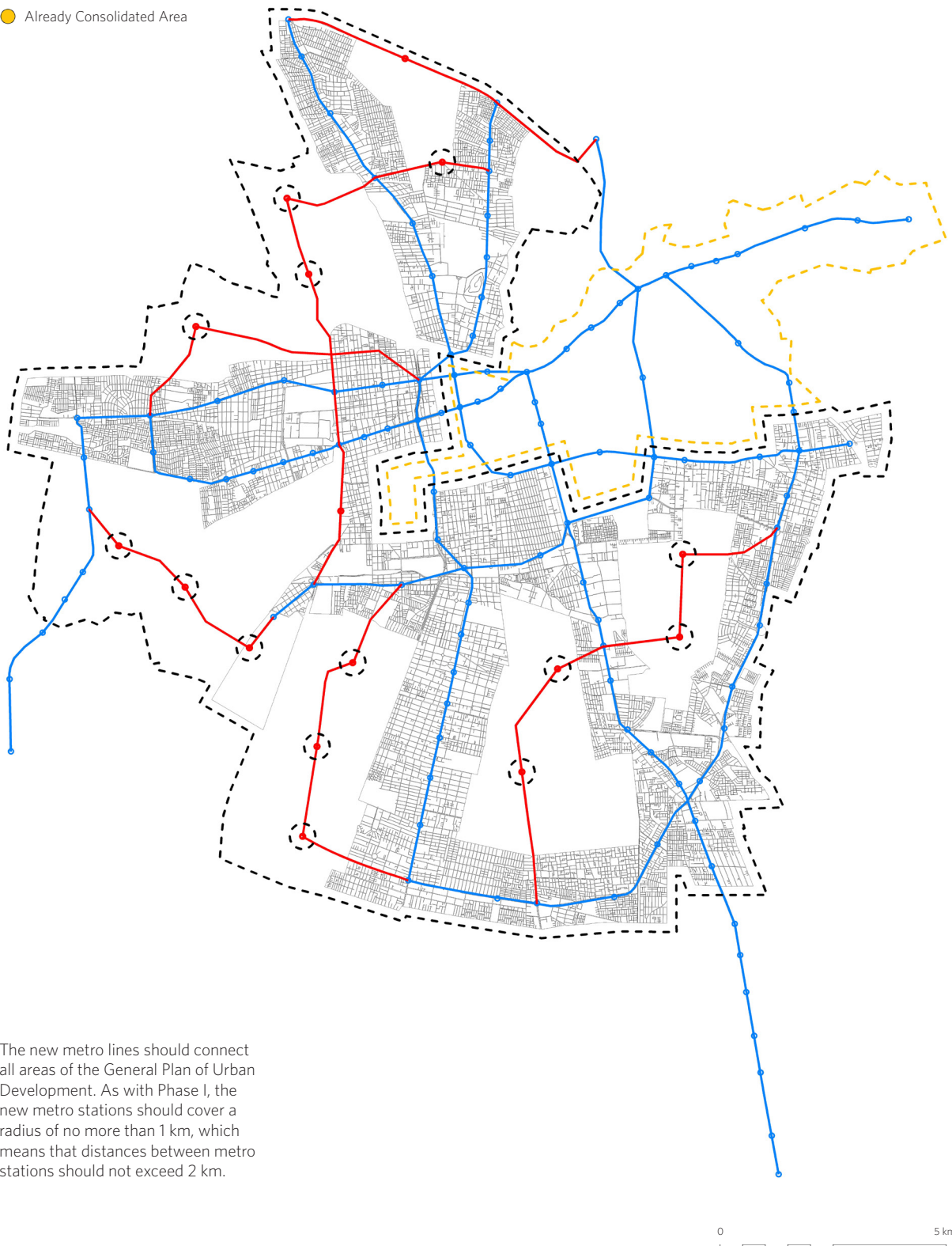


Fig. 1.5
Aerial view of undeveloped central area with connection to the metro transport system. Photo by Guy Wenborne.

- Existing Metro Lines
- New Metro Lines
- New Metro Stations
- Already Consolidated Area



The new metro lines should connect all areas of the General Plan of Urban Development. As with Phase I, the new metro stations should cover a radius of no more than 1 km, which means that distances between metro stations should not exceed 2 km.

Fig. 1.6
General Plan of Urban Development / Phase II: extension of the metro network.

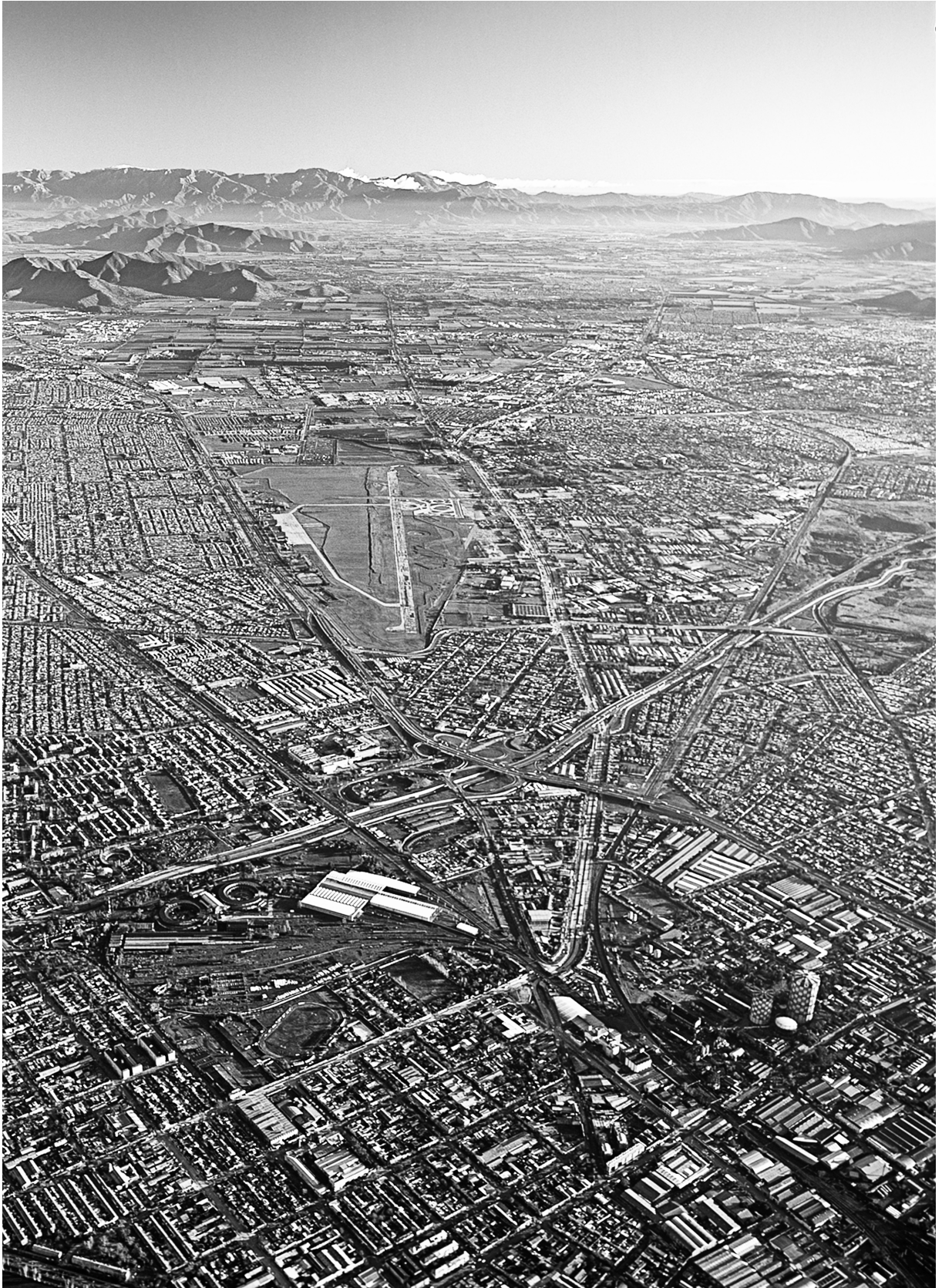
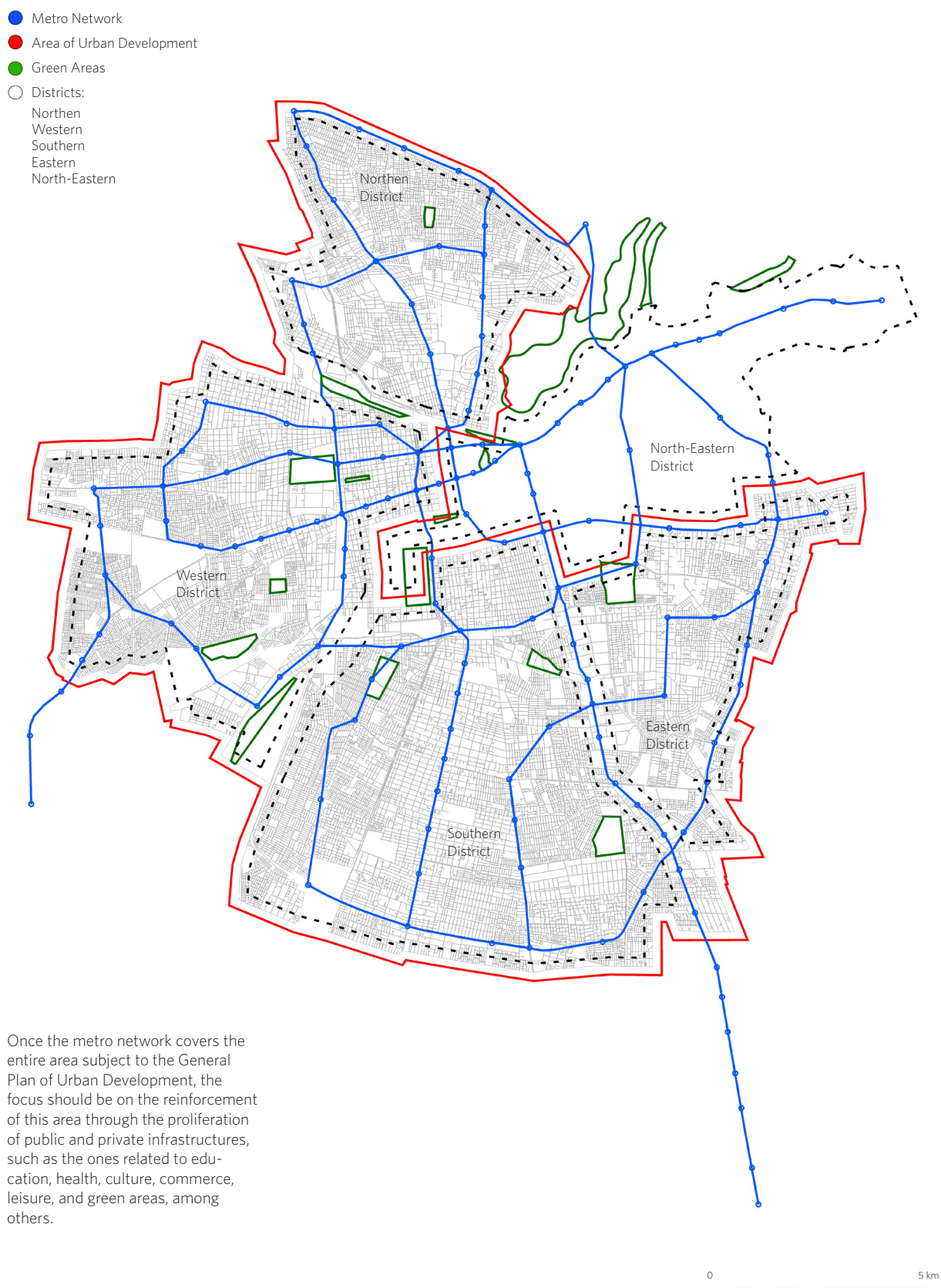


Fig. 1.7
Aerial view of undeveloped central area with no connection to the metro transport system. Photo by Guy Wenborne.



Once the metro network covers the entire area subject to the General Plan of Urban Development, the focus should be on the reinforcement of this area through the proliferation of public and private infrastructures, such as the ones related to education, health, culture, commerce, leisure, and green areas, among others.

Fig. 1.8
General Plan of Urban Development / Phase III: urban consolidation of central areas of the city.



Fig. 1.9
Aerial view of a consolidated area of Santiago (north-eastern area). Photo by Guy Wenborne.

To implement the proposed plan, it is necessary to strategically organize policy instruments, public stakeholders, and administrative bodies involved in the process of housing and infrastructural provision. Once the right to housing and the city is defined, the **Central Government** and **the Ministry of Housing and Urbanism** have the task of putting together the **Urban Densification Policy** with the **General Plan of Urban Development**, between which it will be possible to define general welfare requirements (abstract criteria) and specific planning strategies (concrete criteria). The Policy and Plan are not autonomous instruments but should complement each other, thus requiring continuous assessment by an **External Board**, whose main task is to ensure the compatibility of both instruments.

With the general policy framework already set, it is necessary to define responsibilities and processes at four different levels.

- **Level 1 - Metropolitan Government:** its main task is to organize the territory at a regional scale. This stakeholder has a twofold responsibility: it coordinates the different cities of the region and enforces a **Regional Plan** that defines urban and rural areas. The Regional Plan is a very important instrument to control urban sprawl and considers, among others, an inter-city transport system.
- **Level 2 - City Government:** its obligation is the general management of Santiago's territory and the coordination of the 32 existing municipalities. This administrative body is responsible for enforcing a **City Plan** that specifies the areas subject to both infrastructural reinforcement and densification in relation to the development of the metro transport system.
- **Level 3 - Municipality:** its duty is to administrate a commune and answer to local needs. One of the main responsibilities of the Municipality is to enforce a **Local Plan**. This specifies the areas, blocks or plots subject to urban design, which will provide the required infrastructures (social and physical) and social housing.
- **Level 4 - Housing Department:** this is run by the Municipality but also requires coordination with other state departments responsible for the provision of associated services such as the ones related to education, health, and social development, in order to create a network of social assistance for housing. The Housing Department has the obligation to process and answer to the demand for social or affordable housing on the one hand, and to run programmes related to **housing operational issues** (maintenance, security, and programmes of social surveillance, among others).

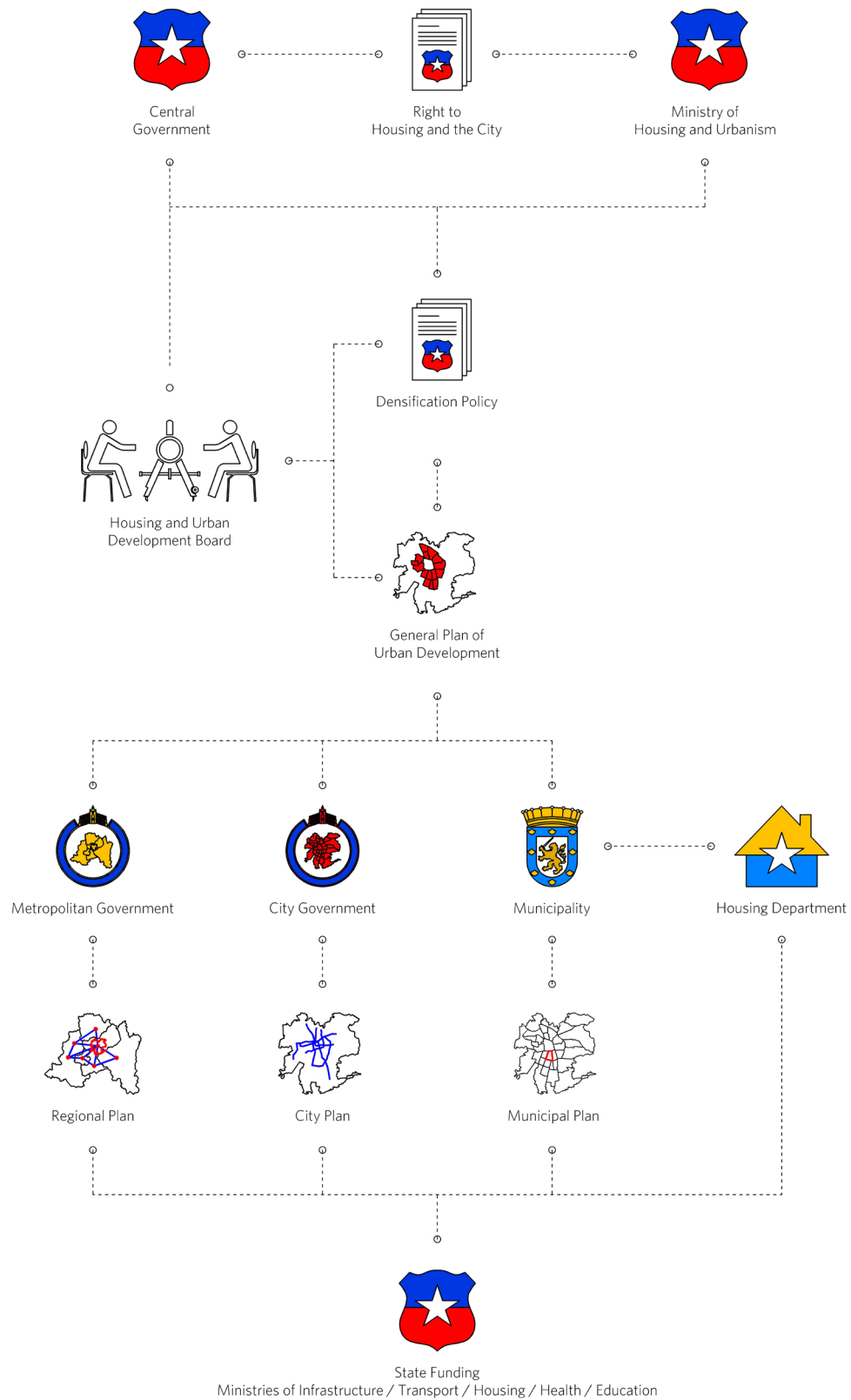


Fig. 1.10
Diagram of involved policy instruments and stakeholders.

The Municipality plays a fundamental role in the implementation of the General Plan due to its ability to both put into action principles of urban design and drive a housing procurement process. The Municipality has to first define desired density levels in relation to the provision of public infrastructures, which should complement the existing ones in the chosen areas. Second, it has the responsibility to orchestrate public and private funding in order to accommodate different forms of housing. **The Municipality requires using a number of policy instruments capable of making plots affordable and to promote, control, and manage the different stakeholders involved in the process of housing provision.** This way, it is possible to define 3 main forms of housing:

- **Private Housing:** investors can produce high-density solutions but are required to include a percentage of social housing, affordable housing, small-scale infrastructures (such as socio-educative facilities), and commercial areas, or open spaces, depending on the contextual circumstances and demands.
- **Affordable Housing:** private capital should be combined with public funding such as state subsidies. This housing should also include a percentage of other functions or programmes, but these have to be supported by public or other associated funds.
- **Social Housing:** in this housing form all the funding should be public, which means that the Municipality becomes the initiator and administrator of its housing procurement.

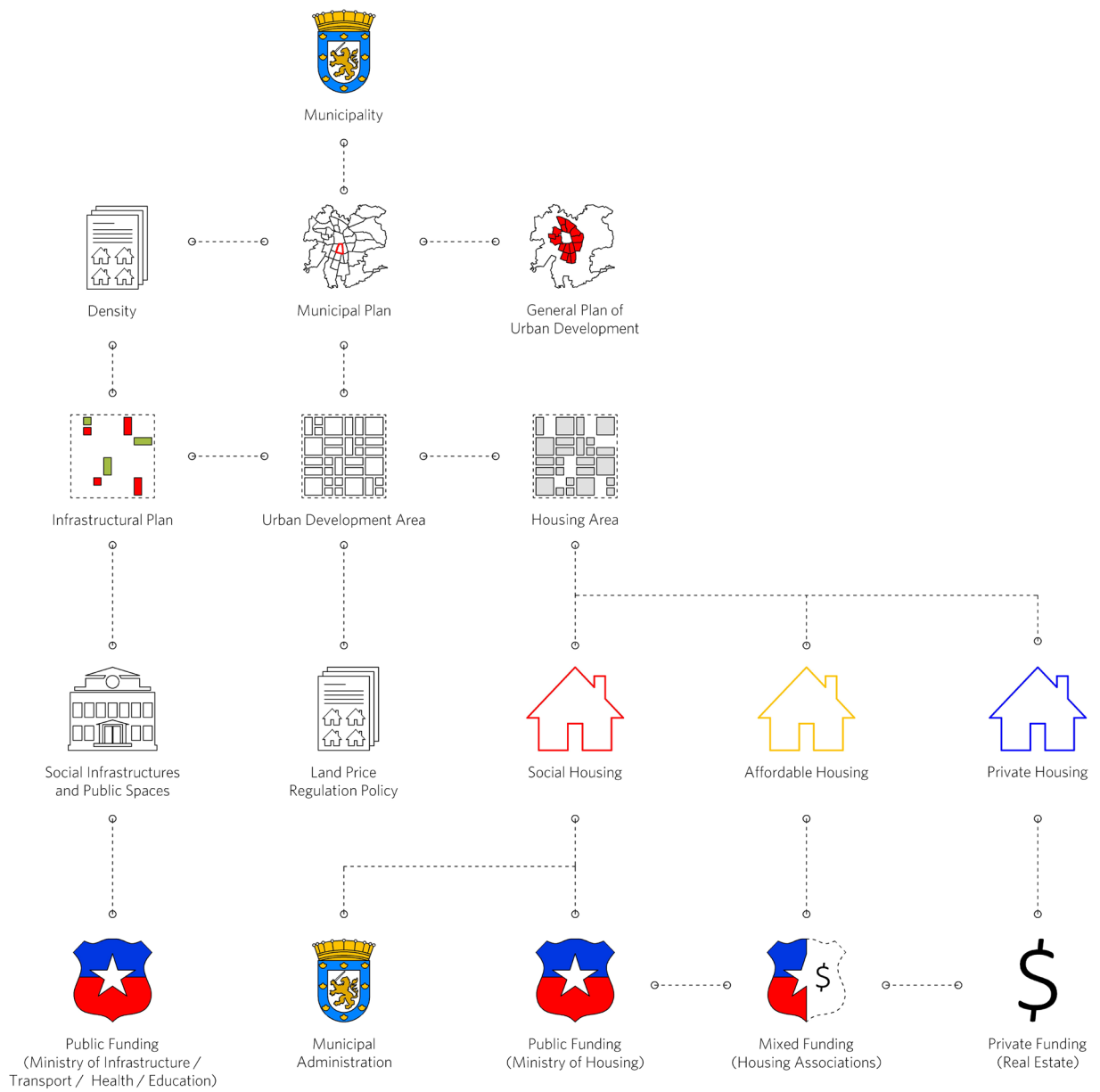


Fig. 1.11
Diagram of the municipal procurement system.

NEIGHBOURHOOD

2

2.1 DESIGN PROBLEM

A neighbourhood is not just a large agglomeration of housing at the urban scale but a physical and social environment where a wide range of daily needs can be answered. This is possible by **thinking housing in relation to its associated mid-scale infrastructures that are required on a daily basis, which should respond to social, cultural, economic, and biological needs.**

The implementation of these ambitions is problematic when looking at recent examples of infrastructural provision. The main problem is the lack of spatial and functional differentiation between physical and social infrastructures, which is evident in the Urban Regeneration Plan of Bajos de Mena (2014). Here, all the infrastructures concentrate in only one area of the neighbourhood, creating an internalized urban compound devoid of major spatial and functional hierarchies. The main reason for this is the secondary role that social infrastructures play in organizing the urban environment – as the ones related to education, health, and other social welfare services – which are intermingled with physical infrastructures such as shopping centres and civic centres. The importance of social infrastructures is not determined only by their ability to answer basic needs but also by their ability to promote principles of coexistence and social development. Those concerns were in fact explicit in Santiago's first social housing developments. A conspicuous example is the Población Leon XIII (1892), which proposed a network of dispersed social infrastructures (school, church, theatre-communal centre, and civic square) with the aim to maximize their presence in the urban space by establishing multiple visual and physical relationships with the built environment. This example highlights a conceptually different approach to the problem of infrastructural provision and offers a way to think neighbourhoods as part of a different design framework.

Based on the above, neighbourhood design should address the following concerns:

- Define versatile mechanisms for the provision of educational, commercial, and leisure infrastructures, which have to be able to adapt and respond effectively to varying urban contexts.
- Establish a spatial and functional differentiation between the physical and social infrastructures needed.
- Arrange infrastructures strategically in the urban realm in order to create an infrastructural network at the neighbourhood scale.

One of the main problems of neighbourhood design is the secondary role that social infrastructures play in organizing the urban environment – as the ones related to education, health, and other social welfare services – which are intermingled with physical infrastructures such as shopping centres and civic centres.



Fig. 2.1
Urban Regeneration Plan for Bajos de Mena (2014).

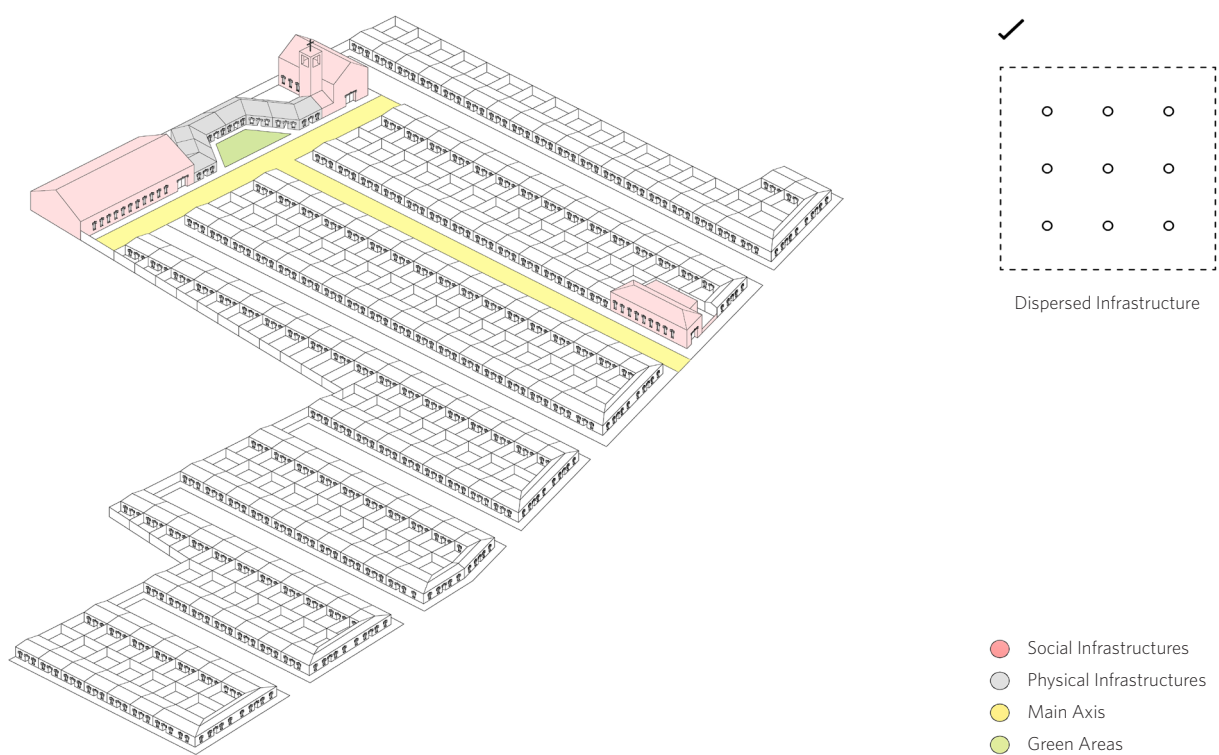


Fig. 2.2
Población Leon XIII (1892).

2.2 PUBLIC SCHOOLS AND NEIGHBOURHOOD PLANNING

Acknowledging the importance of social infrastructures, public school education is proposed as a strategic infrastructure in relation to housing. The main reason for this is the ability of public schools to become an inclusive framework for socio-educational development on the one hand – besides fostering social mobility – and to bring with it a number of other infrastructures that can be shared with neighbours such as nurseries, sports facilities, libraries, theatres, workshops, and leisure spaces. Thus, **public schools are understood as the cornerstone of the planning process of socially-driven neighbourhoods. This process must aim to equip and densify poorly developed areas close to the city centre**, which should have direct access to the metro transport system.

2.3 PRIMARY INFRASTRUCTURAL DEVELOPMENT SYSTEM

The proposed system aims to create a network of school infrastructures.

The proliferation of these infrastructures should go hand in hand with the densification of neighbourhoods, providing 1 school for every 4,000 inhabitants. Based on this logic, a progressive equipping of neighbourhoods is proposed. The main infrastructural elements are the following:

- **Metro Stations:** these are conceived as the starting point of the infrastructural development system. Each infrastructural network can develop around 2 or more metro stations, depending on the size of neighbourhoods and proximity between stations.
- **Primary Schools:** because primary schooling is the same for all, the distance between a house and a primary school should be as short as possible. Based on this, primary schools should be spread throughout neighbourhoods. In addition, primary schools should include a limited number of associated infrastructures that can be shared with the community such as a library, open and roofed playgrounds, and nursery.
- **Secondary Schools:** these provide different forms of education (science, humanities, and technical) and require a number of facilities such as labs, workshops, sports hall, library, theatre, among others. It is proposed to combine secondary schools through an infrastructural core. This will concentrate different facilities that can be accessed by students and the community.
- **Circulations:** metro stations, primary schools, and secondary schools should be connected by streets, which should have a clear spatial hierarchy in neighbourhoods.

The proposed infrastructures can be combined in many ways and respond to varying contexts – determined by the relationship with metro stations – which can produce radial, linear, or axial arrangements, as exemplified in the proposed matrix of infrastructural networks.

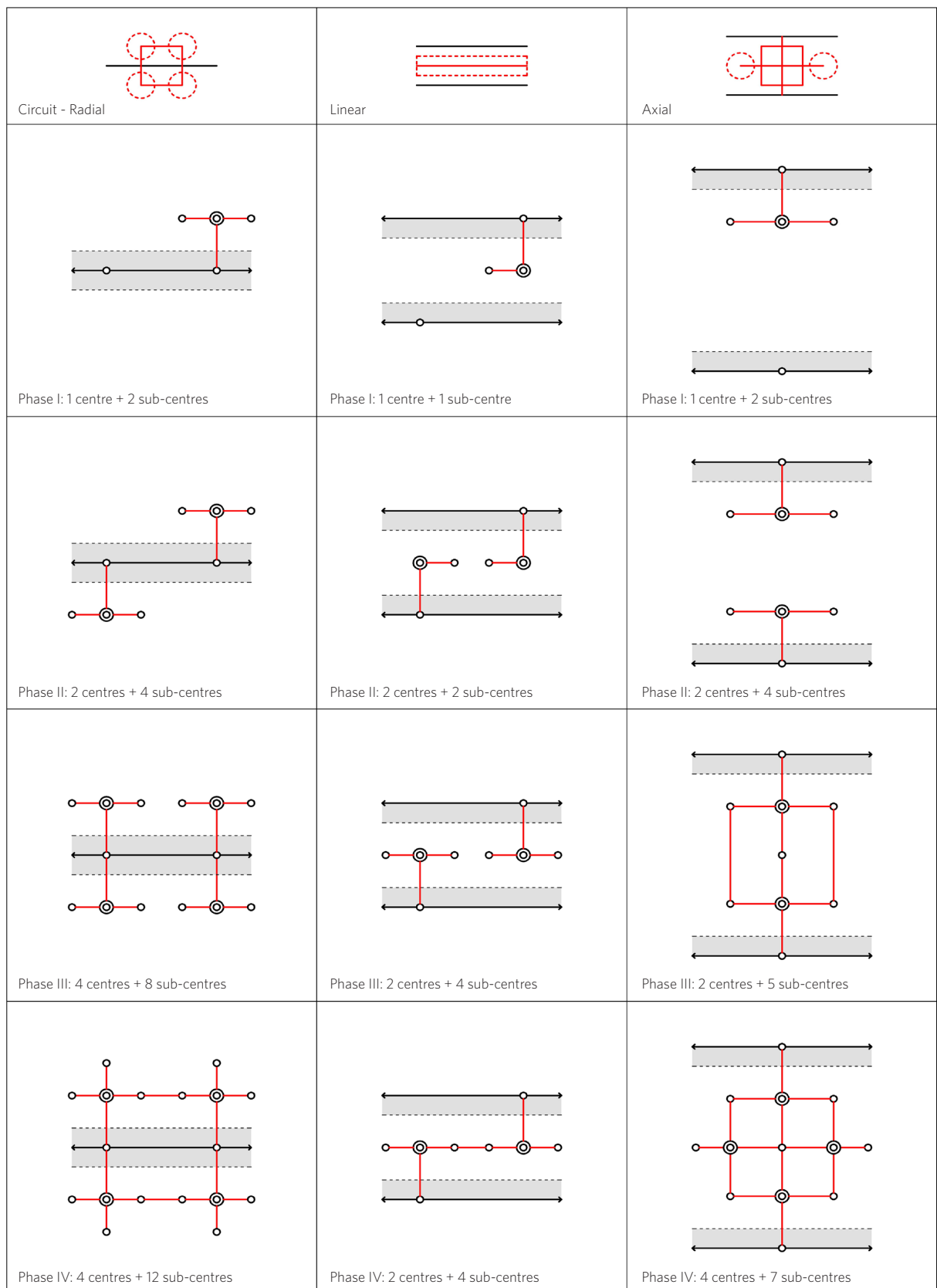


Fig. 2.3
Primary infrastructural development system. Circuit-radial, linear, and axial arrangements.

2.4 SECONDARY INFRASTRUCTURAL DEVELOPMENT SYSTEM

With the primary system defined, a secondary system is proposed in order to provide a rationale for the programmatic and functional development of neighbourhoods. This rationale is based on the combination of three infrastructural arrangements:

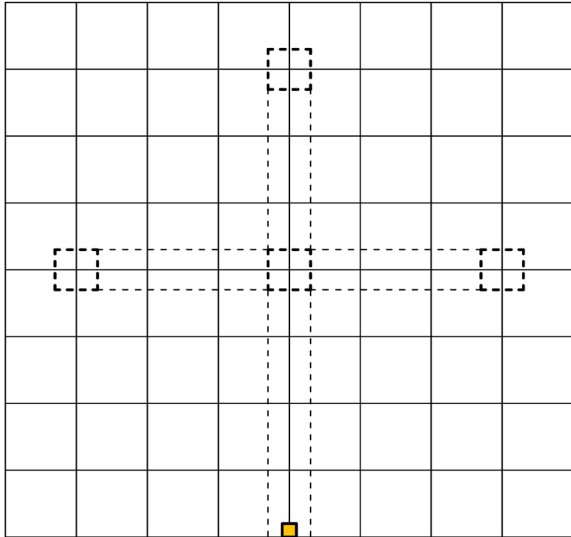
- **Boulevards:** housing and commercial areas as linking elements (circulation spaces)
- **Neighbourhood Centre:** secondary school and communal infrastructures as main organizational elements.
- **Neighbourhood Sub-Centres:** primary school, communal green area, and housing as elements located at the boundaries or intermediate points of a neighbourhood arrangement.

The system is first determined by the provision of each infrastructure but evolves as the area becomes denser. In doing so, it asks for the creation of more sub-centres and boulevards on the one hand, and the programmatic reinforcement of the neighbourhood centre on the other.

- Metro Station
- Boulevard
- Commercial Area and Housing
- Health Centre or other Social Service
- Communal Infrastructure
- Secondary School
- Primary School
- Communal Green Area

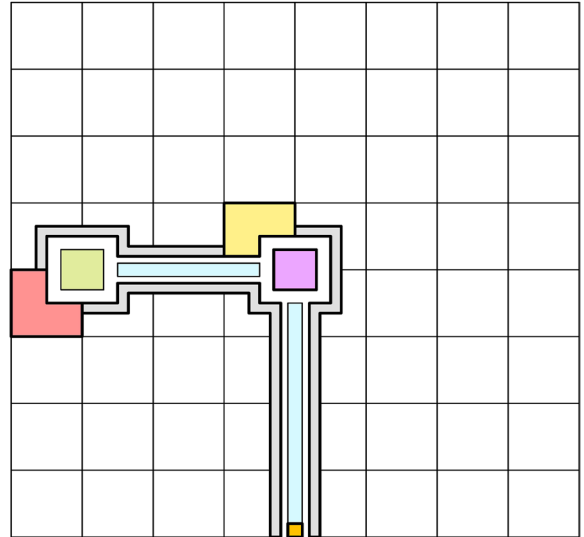
Phase I:

Planning of area subject to a process of infrastructural reinforcement. The starting point of the planning process should be determined by a metro station.



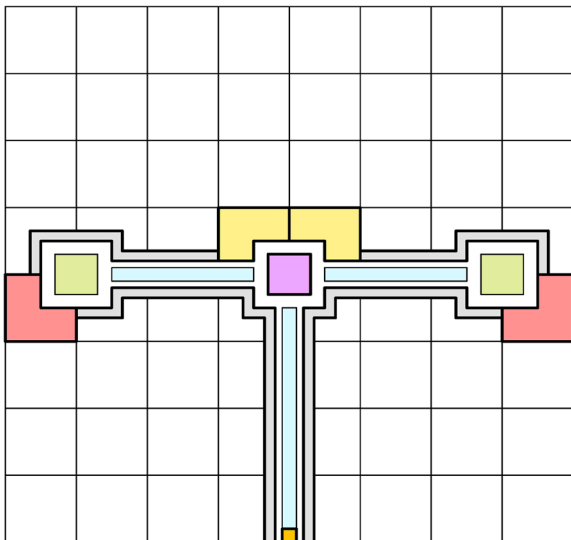
Phase II:

The first infrastructures consist of 1 secondary school (neighbourhood centre) and 1 primary school (neighbourhood sub-centre), which are connected through boulevards.



Phase III:

The process continues with the reinforcement of the neighbourhood centre through the provision of 1 more secondary school and the creation of another neighbourhood sub-centre through a second primary school.



Phase IV:

The process is complete when all the residential areas have access to a primary school, which is complemented by the reinforcement of the neighbourhood centre through another secondary school and a health centre.

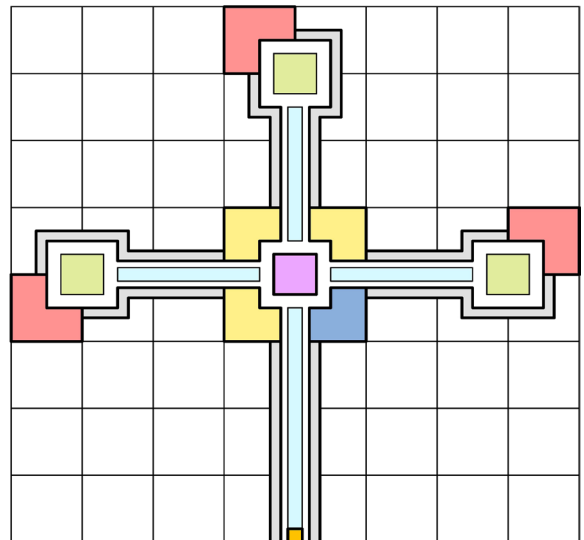


Fig. 2.4
Secondary system for the arrangement of different infrastructures based on a centre, boulevards, and sub-centres.

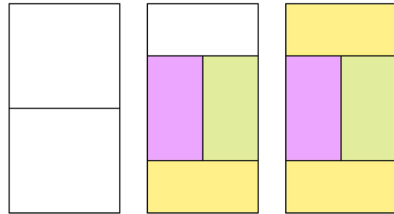
2.5 TERTIARY INFRASTRUCTURAL DEVELOPMENT SYSTEM

The tertiary system has to do with **introducing a logic of state interventions needed to both provide infrastructures and create urban spaces**, which should respond to a previously defined area subject to neighbourhood planning. The criteria for each infrastructure is the following:

- **Neighbourhood Centres:** the state should buy the plots needed for the immediate provision of 1 secondary school and a communal infrastructure capable of accommodating a number of functions such as a nursery, sports facilities, library, theatre, workshops, and leisure spaces. This first stage can be then followed by future state investments into secondary schools and other social infrastructures such as a health centre or social housing. Such a logic can be applied in either 2 mid- to large-size blocks or many blocks, depending on the contextual needs.
- **Neighbourhood Sub-Centres:** the state should buy the plots needed for the immediate provision of 1 primary school. However, to create a large communal green area, a system of indirect expropriation is required. This asks private owners to contribute with a portion of their plot when new buildings are built. To make this possible, municipalities have to define priority zones for residential development. These zones can be enforced through planning instruments incentivizing housing developments within or penalize the ones outside of these areas, increasing or decreasing built ratios depending on the case. In terms of the implementation of neighbourhood sub-centres, these can also fit in either 2 mid- to large-size blocks or many blocks.
- **Boulevards:** these should follow a system of indirect expropriation in order to create hierarchical streets with a width between 30 and 40 meters. This dimension can accommodate a number of commercial activities such as shops, restaurants and other small-scale private programmes.

- Boulevard
- Commercial Area and Housing
- Health Centre or other Social Service
- Communal Infrastructure
- Secondary School
- Primary School
- Communal Green Area

Arrangement of 2 Blocks of around 100x100 m

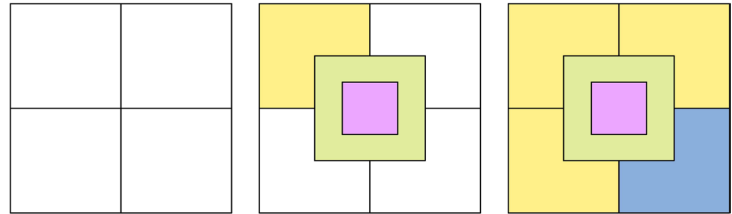


Phase I

Phase II

Phase III

Arrangement of 4 Blocks of around 100x100 m



Phase I

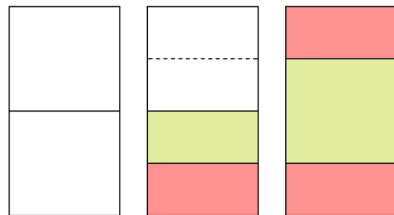
Phase II

Phase III

Fig. 2.5

Phasing strategies for neighbourhood centres: plots can be fused in order to accommodate the communal infrastructure and green area (built in phase II) at the centre, making them accessible for schools and neighbours. A new street layout is needed.

Arrangement of 2 Blocks of around 100x100 m

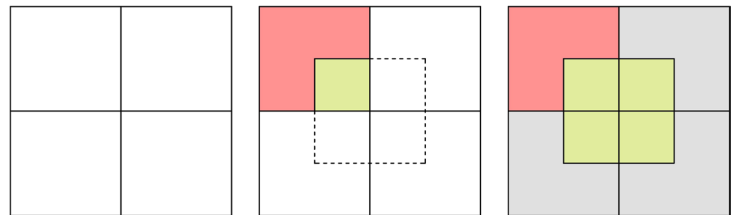


Phase I

Phase II

Phase III

Arrangement of 4 Blocks of around 100x100 m



Phase I

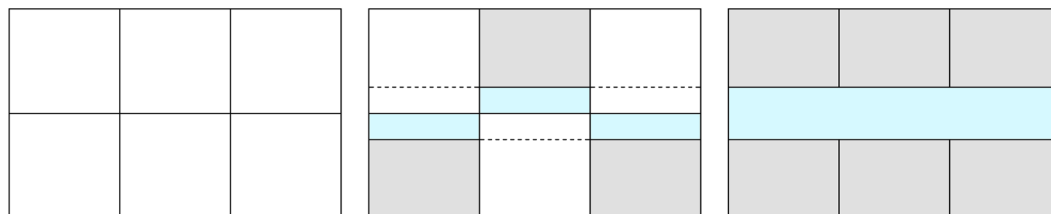
Phase II

Phase III

Fig. 2.6

Phasing strategies for neighbourhood sub-centres: plots can be fused in order to accommodate a green area at the centre, which grows as the housing blocks develop. A new street layout is needed.

Arrangement of 6 Blocks of around 100x100 m



Phase I

Phase II

Phase III

Fig. 2.7

Phasing strategy for boulevards: although a new street layout is not required (streets are instead widened), it is important to create a continuity of open spaces that can later become a boulevard.

2.6 SPATIAL AND CONTEXTUAL CRITERIA

As well as considering diagrammatic relationships, **the proposed infrastructural arrangements should also respond to spatial criteria in order to assemble different functions coherently**. Responding to this concern, a set of strategies that exemplify the progressive formation of urban arrangements is proposed, which can respond to contexts determined by small blocks (40x100 meters) or medium blocks (80x100 meters) – large blocks are not considered here because they are very unusual in central areas of Santiago. The criteria is the following:

- **Boulevards:** the priority should be creating the main street. This should be framed by a continuity of mid-rises or high-rises. Once this is achieved, the rest of the block can be developed through low-, mid-, or high-rise arrangements depending on its size and orientation.
- **Neighbourhood Sub-Centres:** the main concern should be to spatially balance the height of the primary school with housing high-rises. This can be achieved by establishing similar heights in parallel sites, combining mid-rises with high-rises.
- **Neighbourhood Centres:** the focus should be the creation of a continuous facade capable of bringing together the different secondary schools and other social infrastructures, among which it is possible to create a spatial framework for the communal infrastructure.

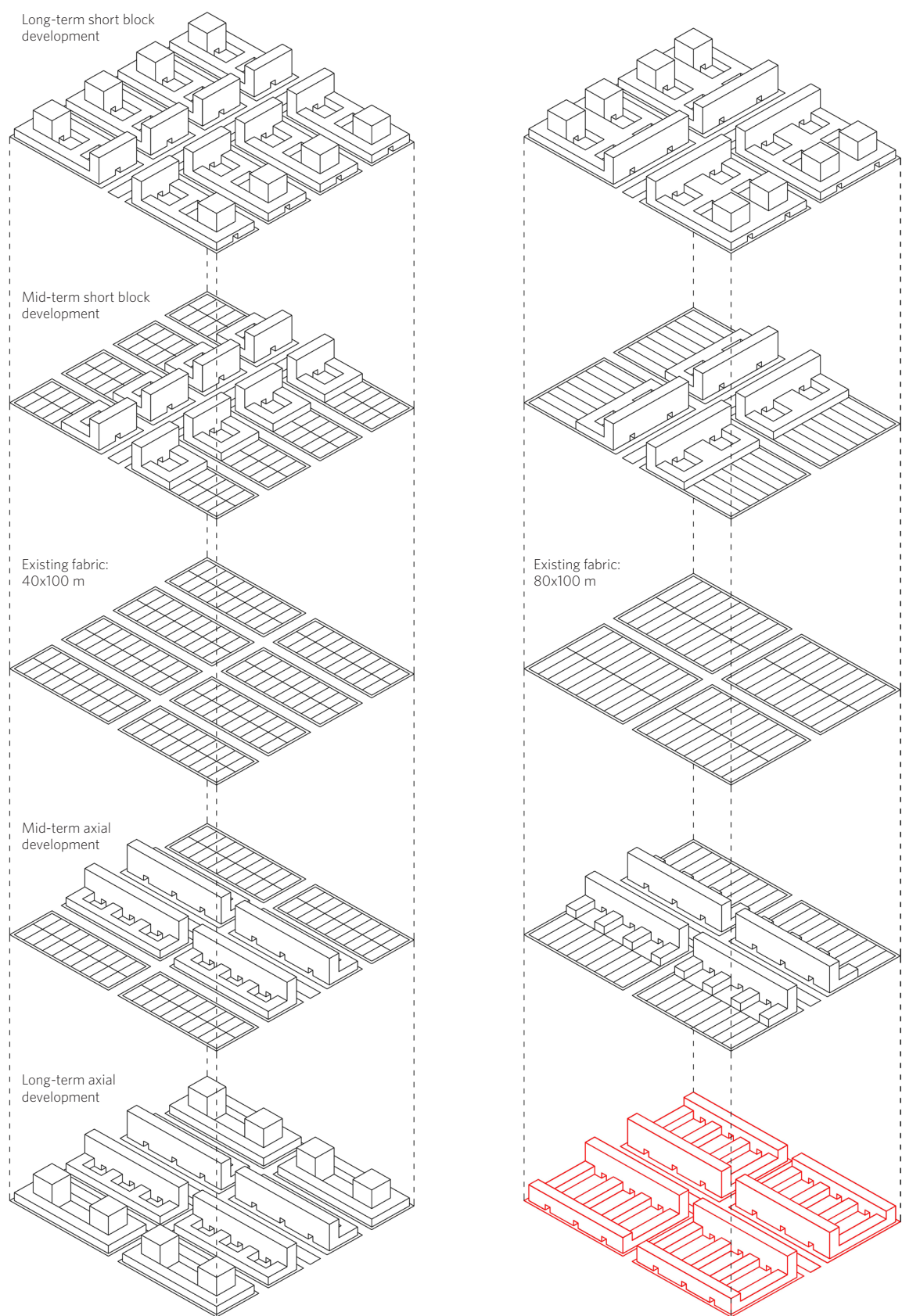


Fig. 2.8
Phasing strategy for boulevards in blocks of 40x100 and 80x100 meters (in red example to be developed in detail).

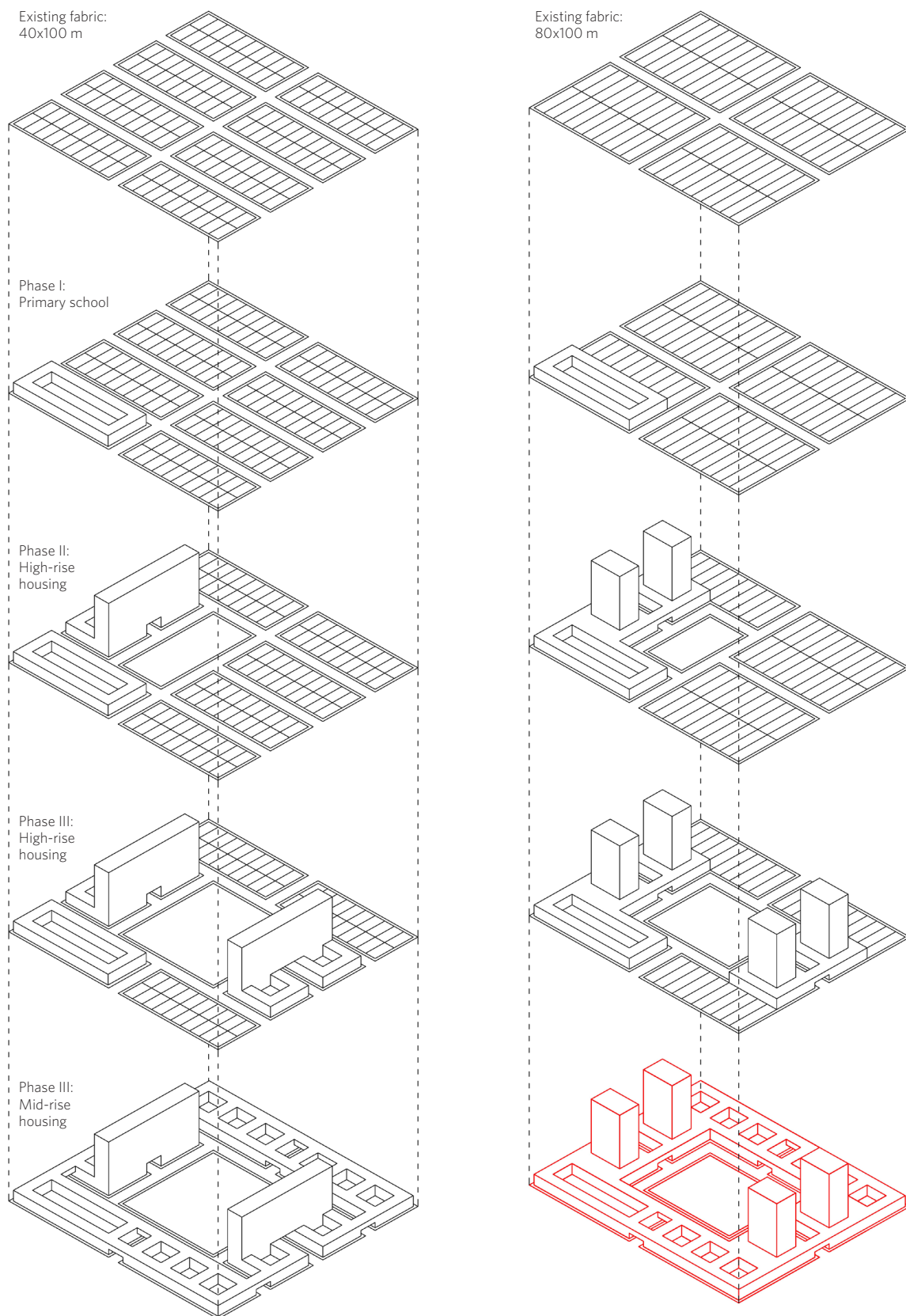


Fig. 2.9
Phasing strategy for an infrastructural sub-centre in blocks of 40x100 and 80x100 meters (in red example to be developed in detail).

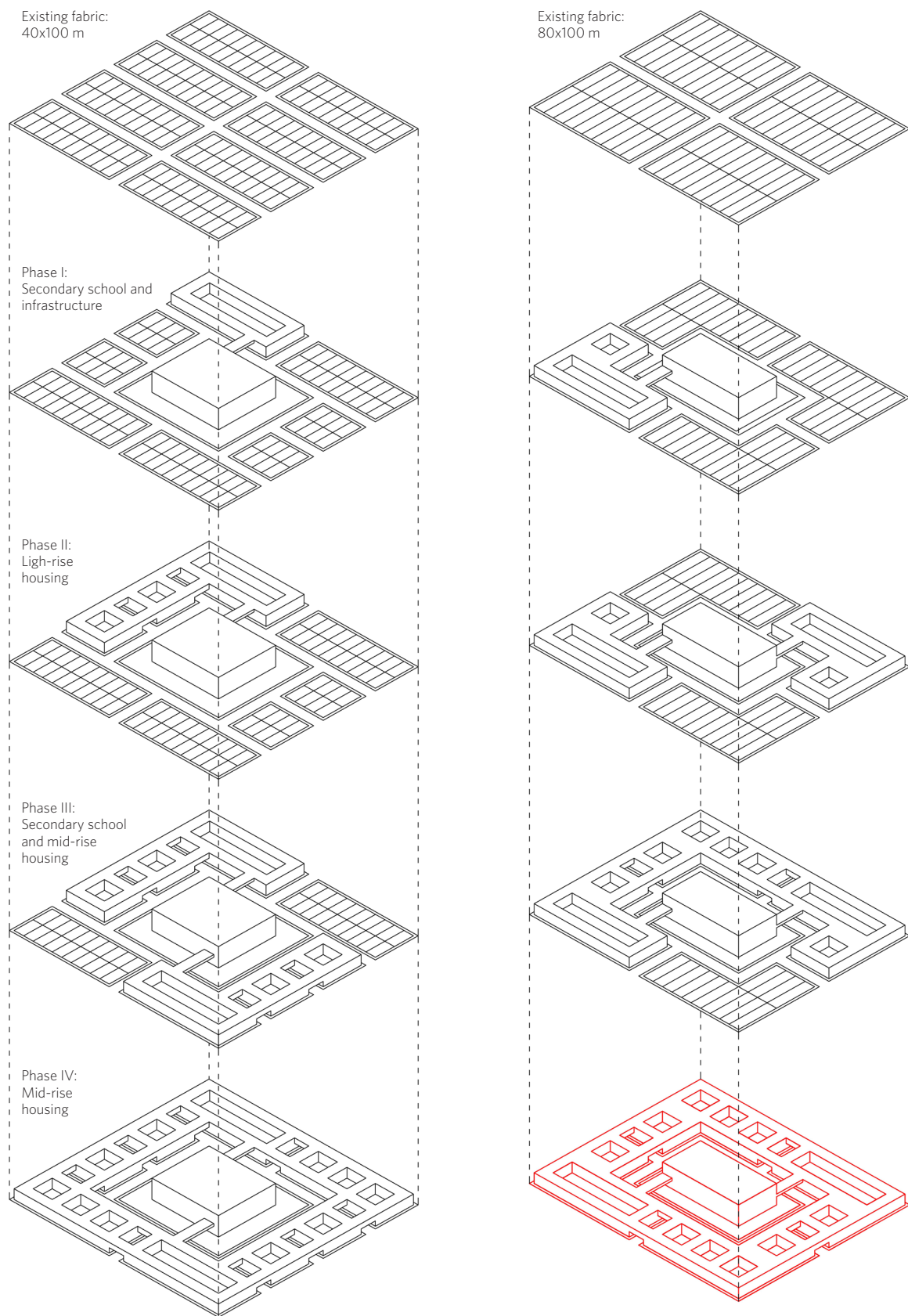


Fig. 2.10
Phasing strategy for an infrastructural centre in blocks of 40x100 and 80x100 meters (in red example to be developed in detail).

2.7 DESIGN EXAMPLES

From the proposed system of urban assemblies, some of the suggested spatial and functional possibilities can be developed in detail. This is by providing one example for each type of infrastructural arrangement. **The aim is to underline the design criteria needed to make compatible the different infrastructural and housing elements.** The examples address the following approaches:

- **Example 1:** Pedestrian and Vehicular Routes (Boulevard)
- **Example 2:** Infrastructural Plinth (Neighbourhood Sub-Centre)
- **Example 3:** Civic Centre (Neighbourhood Centre)
- **Example 4:** Leisure Centre (Neighbourhood Centre)

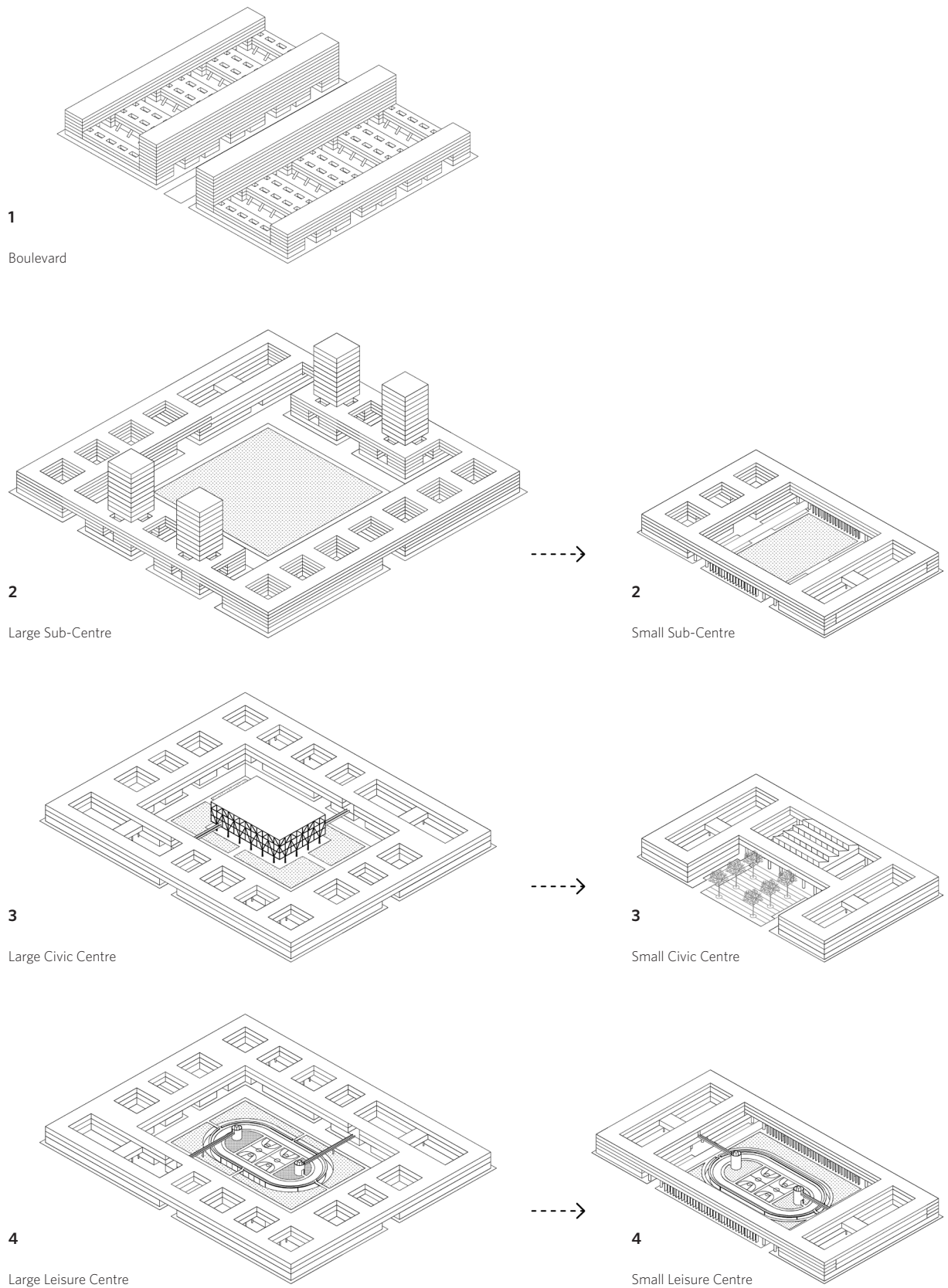


Fig. 2.11
Examples of neighbourhood arrangements: Boulevard, Neighbourhood Sub-Centre, Civic Centre, Leisure Centre.

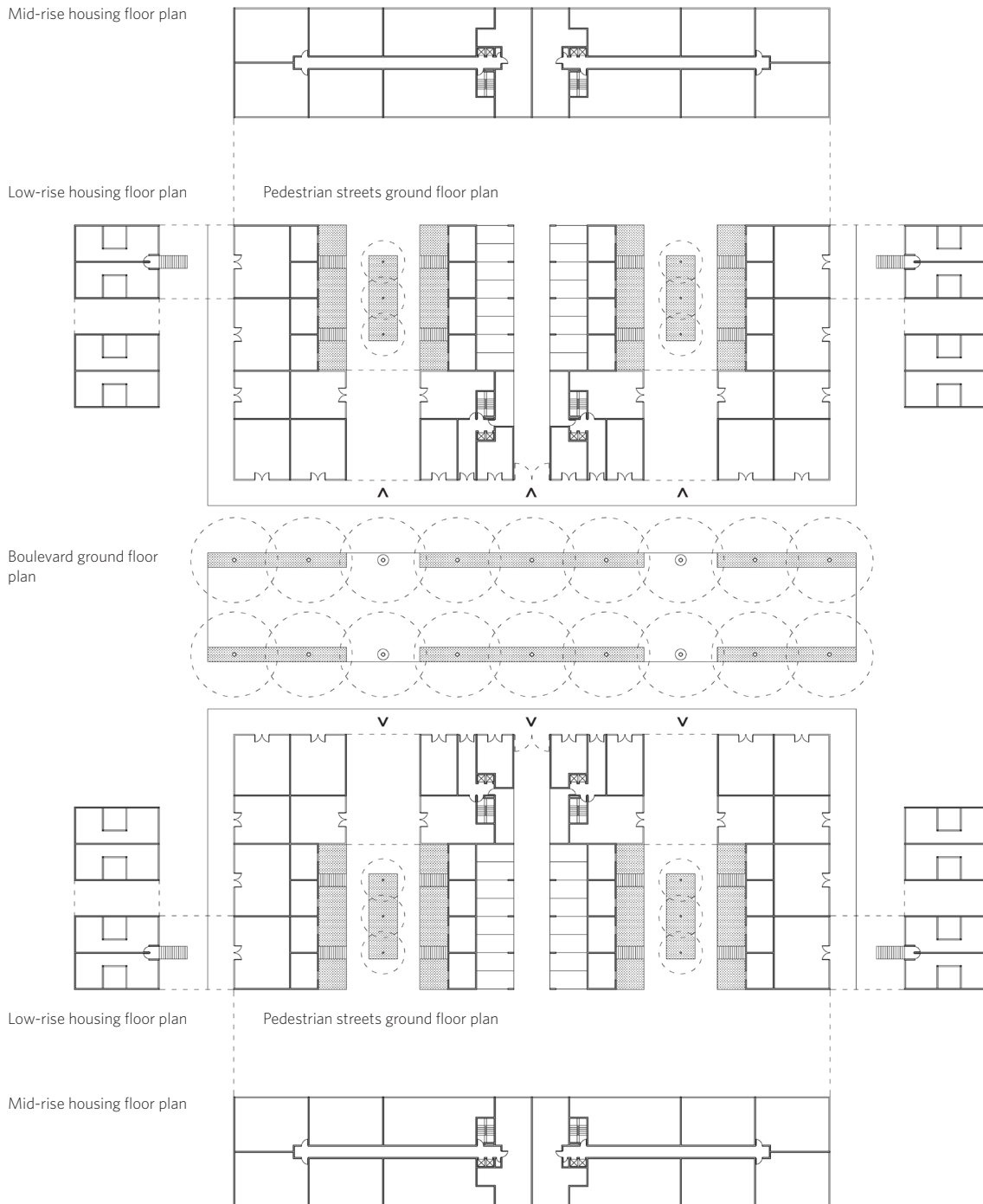


Fig. 2.12
General floor plans (boulevard, housing, shops, and parking area).

Example 1: Pedestrian and Vehicular Routes (Boulevard)

Proposed here is the encounter between minor pedestrian streets (residential areas) and a vehicular and pedestrian boulevard (commercial area). Such an encounter requires a careful treatment of the ground floor by accommodating a number of individual accesses – including low-rise housing, mid-rise housing, parking areas, and shops – and a street design that considers the tree planting and greening of the main routes.

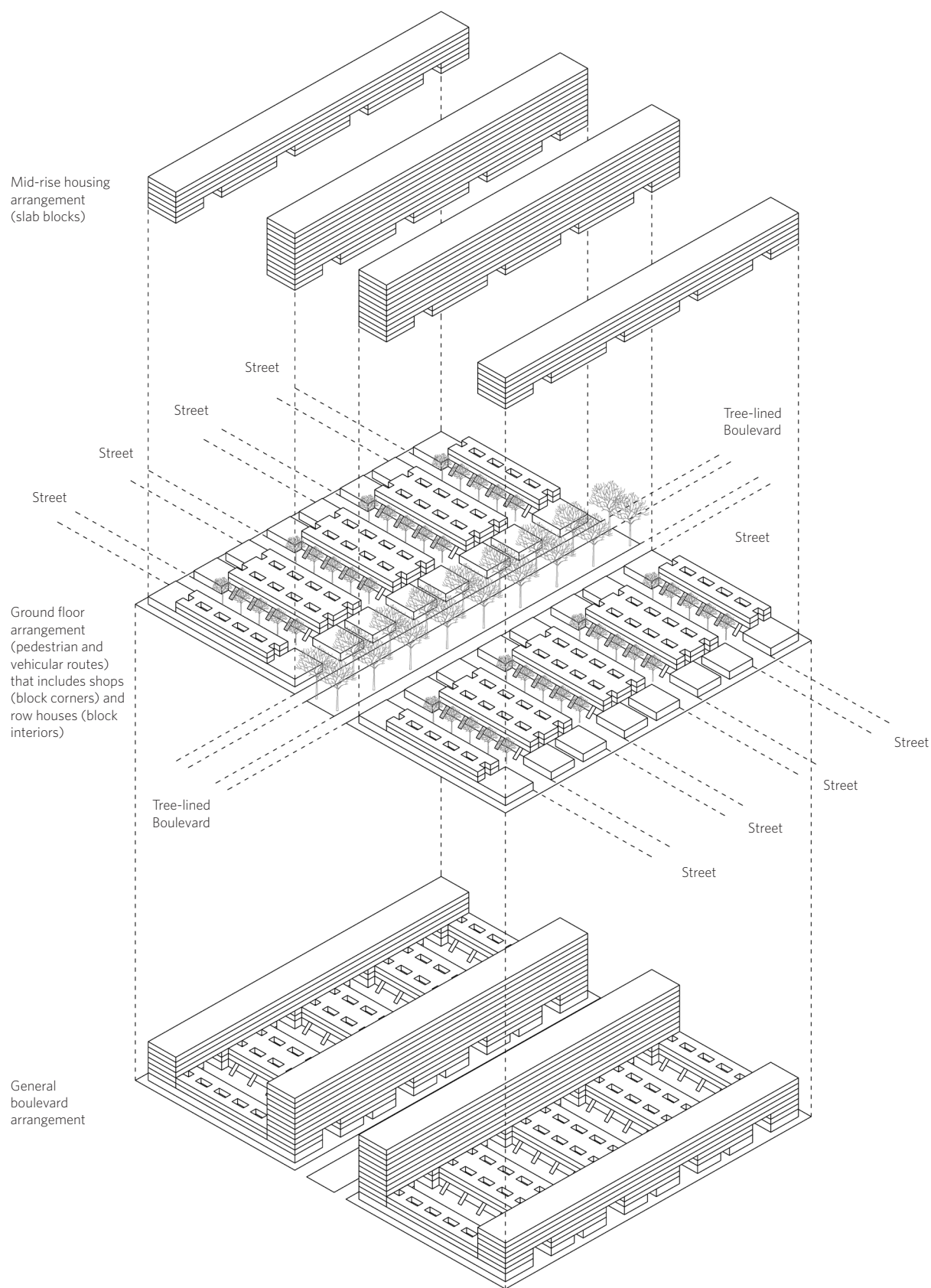


Fig. 2.13
Axonometric drawing of general boulevard arrangement.

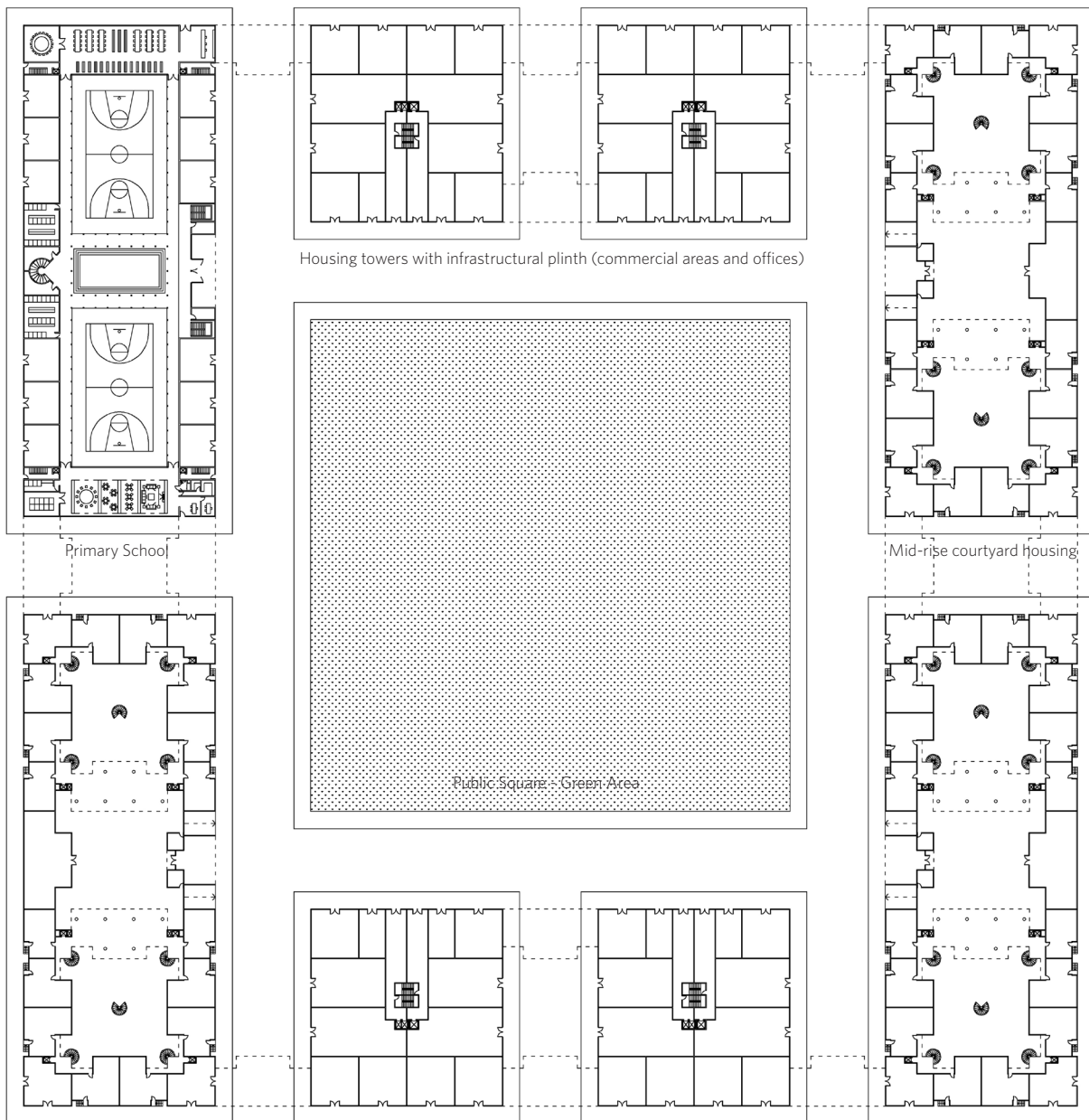


Fig. 2.14
General ground floor plan (primary school, square, offices, mid-rise housing, and high-rise housing).

Example 2: Infrastructural Plinth (Neighbourhood Sub-Centre)

This example develops in four blocks of 80x100 and combines a primary school, mid-rise housing, high-rise housing, and office buildings through an infrastructural plinth that brings all these programmes together. This is possible by a system of small courtyards – although with a sufficient size capable of accommodating the internal functions of each programme and provide sun light access – that allows to release part of the ground and create a large communal green area. The design logic proposed here also applies to smaller urban arrangements, creating a plinth that combines a primary school with either mid-rise housing or a high-rise building hybrid (offices and housing).

Housing towers with infrastructural plinth (commercial areas and offices)

Mid-rise courtyard housing

General infrastructural arrangement

Primary school and central square

Fig. 2.15
Axometric drawing of general arrangement.

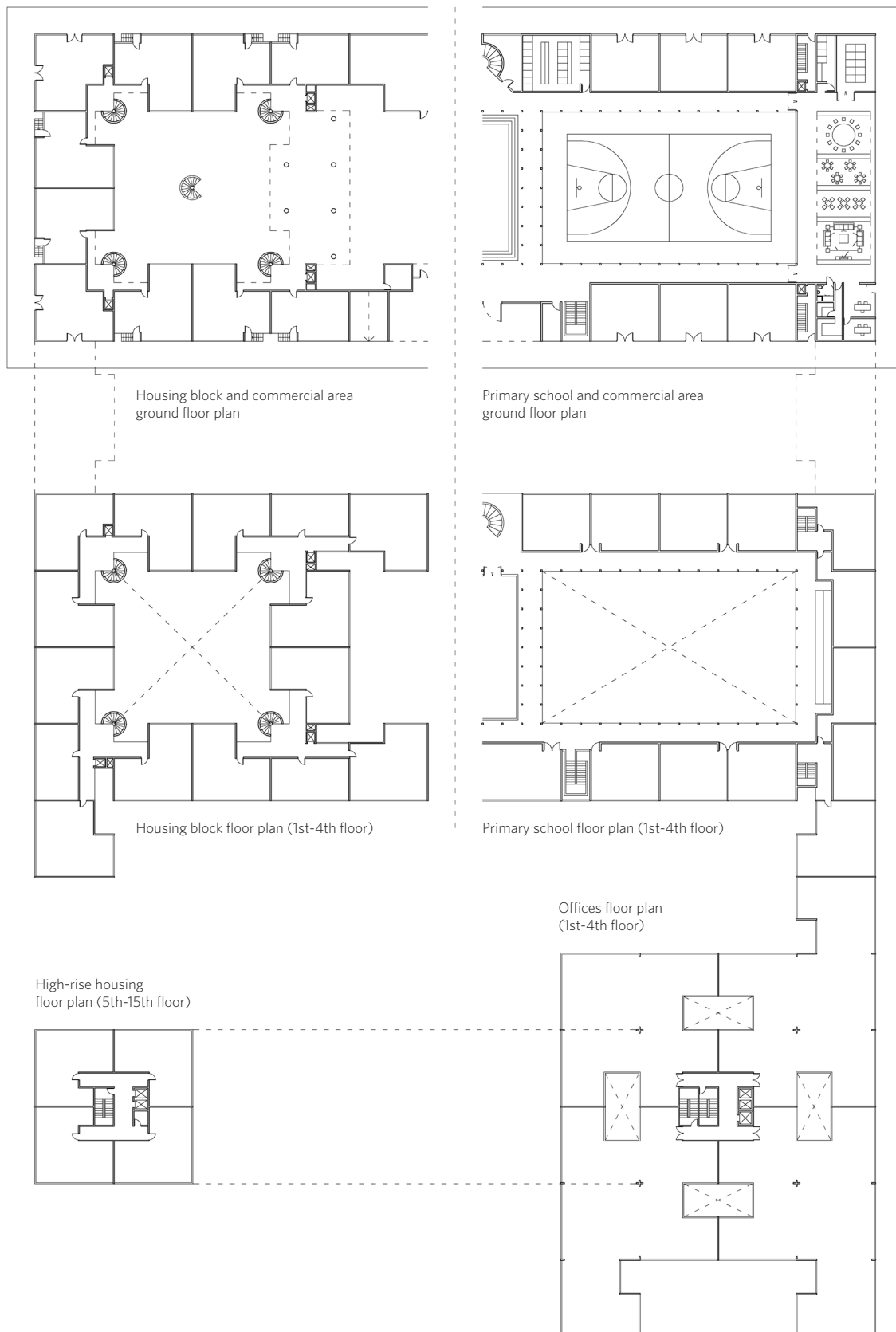


Fig. 2.16
Detail of floor plans (primary school, offices, mid-rise housing, and high-rise housing).

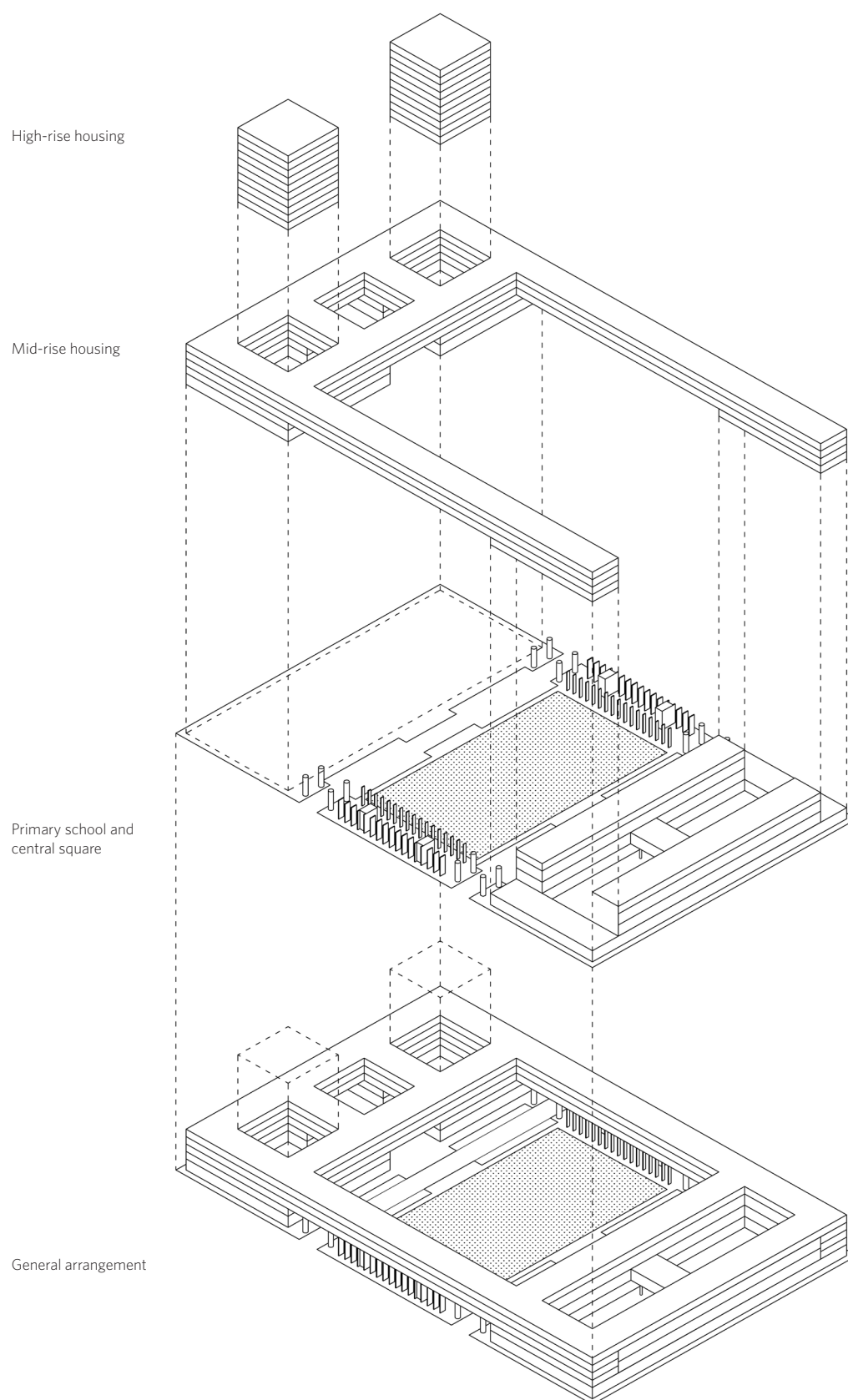
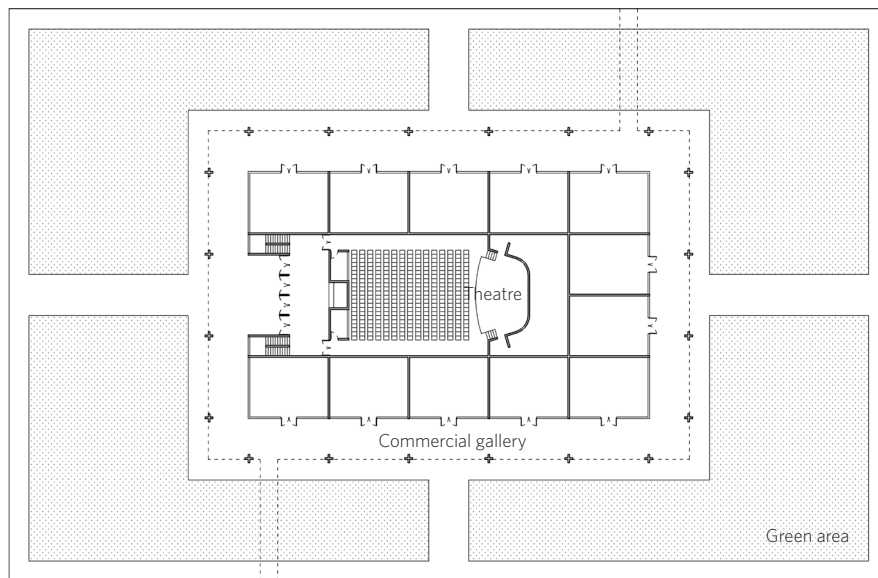


Fig. 2.17
Axonometric drawing of smaller infrastructural arrangement that follows the previously described design logic (2 60x100 m blocks).

Ground floor
plan



1st floor
plan

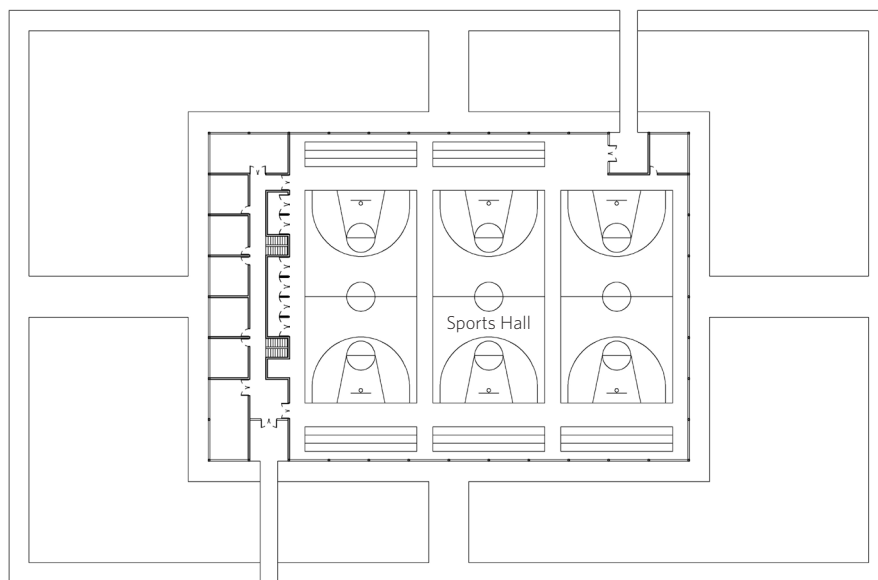


Fig. 2.18
Floor plans of shared infrastructure (theatre, commercial area, sports hall, library, workshops, and administrative offices).

Example 3: Civic Centre (Neighbourhood Centre)

One possibility for creating a neighbourhood centre is a civic centre; a design has to pay special attention to the infrastructure shared by secondary schools and the community. The main reason for this is that the shared infrastructure has to be accessed from public spaces and schools. Addressing this design concern, the proposed example develops as a civic building that can be accessed either from gateways (secondary schools disposed at the perimeter) or the ground floor (neighbours or general public). The civic building surpasses the height of the surrounding buildings and accommodates in the elevated floors a sports hall, dressing rooms, library, workshops, study rooms, and administrative offices, and the ground floor brings together a reception room, theatre, and shops. This strategy can also apply for smaller urban arrangements, creating a hybrid building that accommodates two secondary schools on the sides and brings the communal infrastructure and an open civic space to the centre.

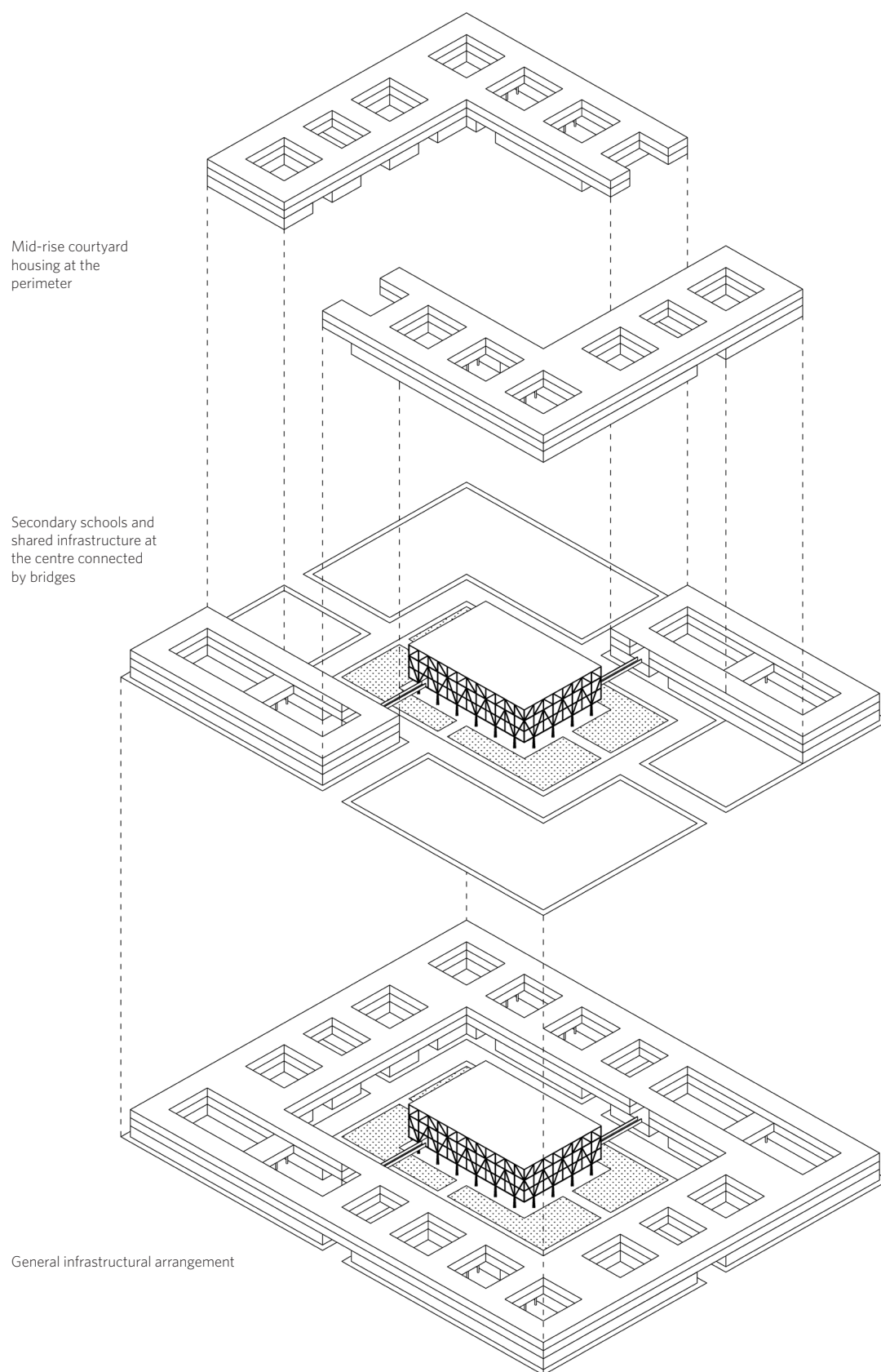


Fig. 2.19
Axonometric drawing of general infrastructural arrangement.

Sports hall, library, workshops
and administrative offices
(1st to 4th floors)

General arrangement of
shared infrastructure

Commercial area and
theatre entrance
(ground floor)

Theatre (basement)

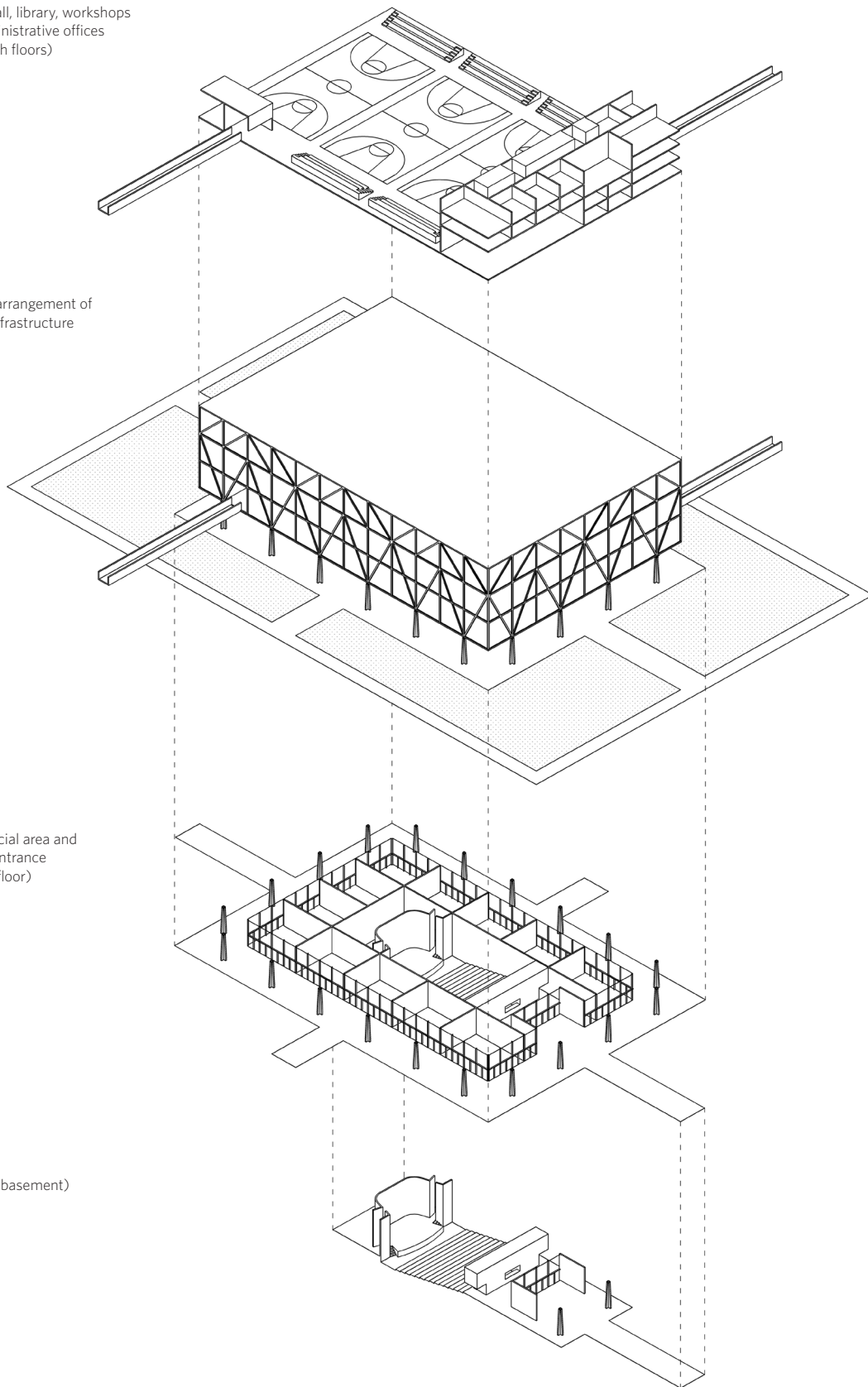


Fig. 2.20
Axonometric drawing of shared infrastructure (theatre, sports centre, library, workshops, and shops).

Sports hall, library, workshops
and administrative offices
(1st to 4th floors)

Commercial gallery,
theatre entrance, and
green area (ground floor)

Theatre (basement)

General arrangement of
shared infrastructure

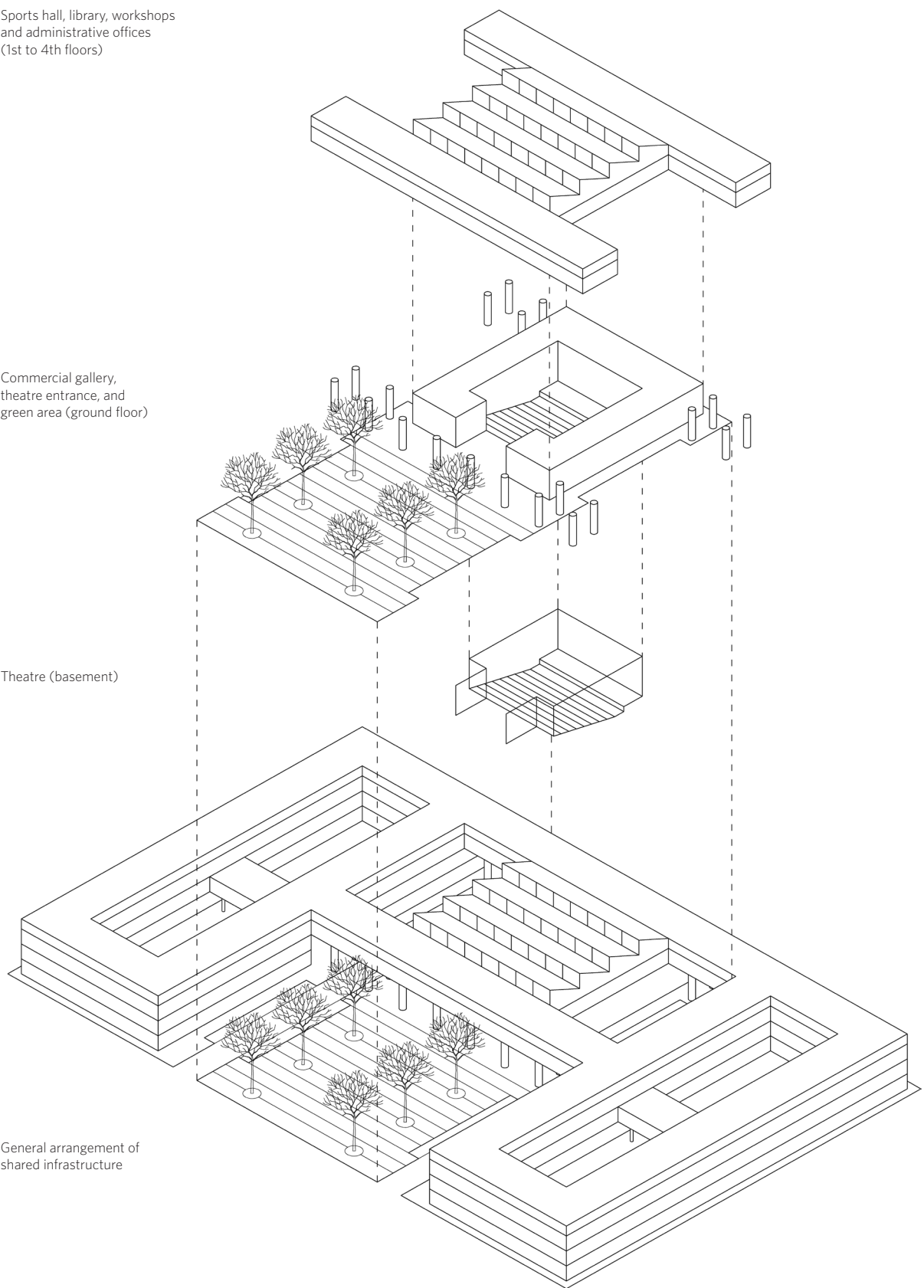
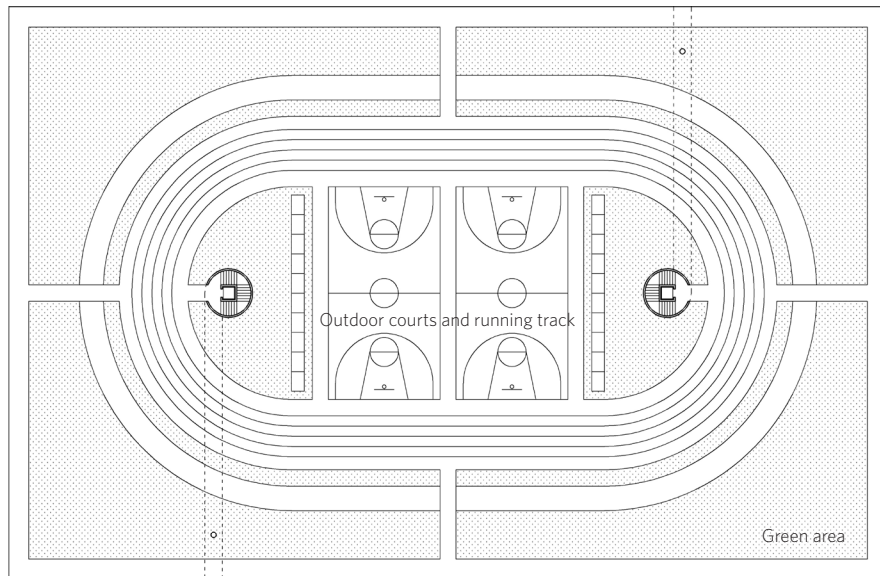


Fig. 2.21
Axonometric drawing of smaller infrastructural arrangement that follows the previously described design logic (2 60x100 m blocks).

Ground floor
plan



Basement floor
plan

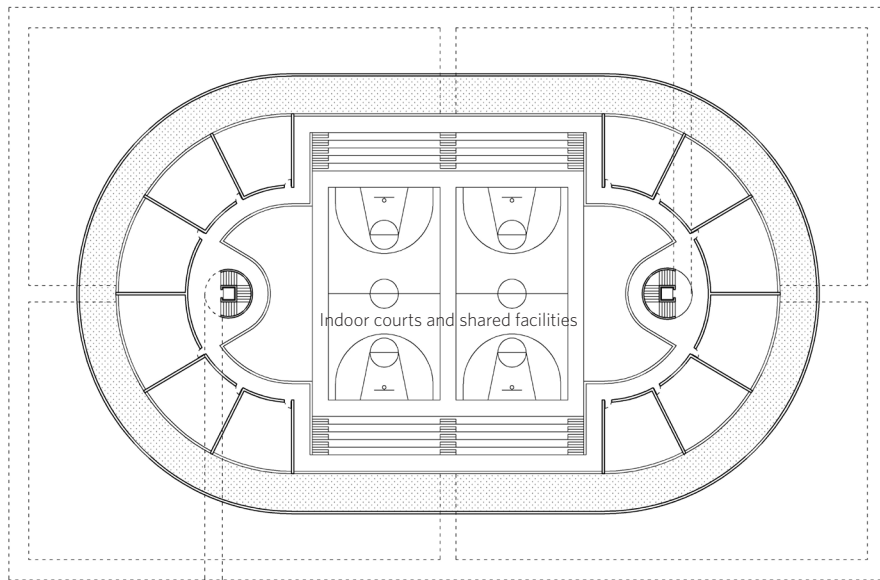


Fig. 2.22
Floor plans of shared infrastructure (square, sports centre, library, and workshops).

Example 4: Leisure Centre (Neighbourhood Centre)

Another possibility for creating a neighbourhood centre is a leisure centre. This urban arrangement follows the same design concerns of the civic centre but has a different programme and spatial outcome. The example that is proposed here consists of an underground building that creates an open space on top that provides both a square for the community and sports facility for schools. Based on this idea, the design locates a running track and sports courts on the ground level, which are surrounded by a moat that creates a physical boundary – providing security to students during school hours – and brings sun light to the underground level. This level has a more controlled access and is equipped with a sports hall that can become a theatre and other educational facilities. The same way as in the previous examples, a leisure centre can also develop in smaller contexts by framing the communal infrastructure through two secondary schools and mid-rise buildings (housing).

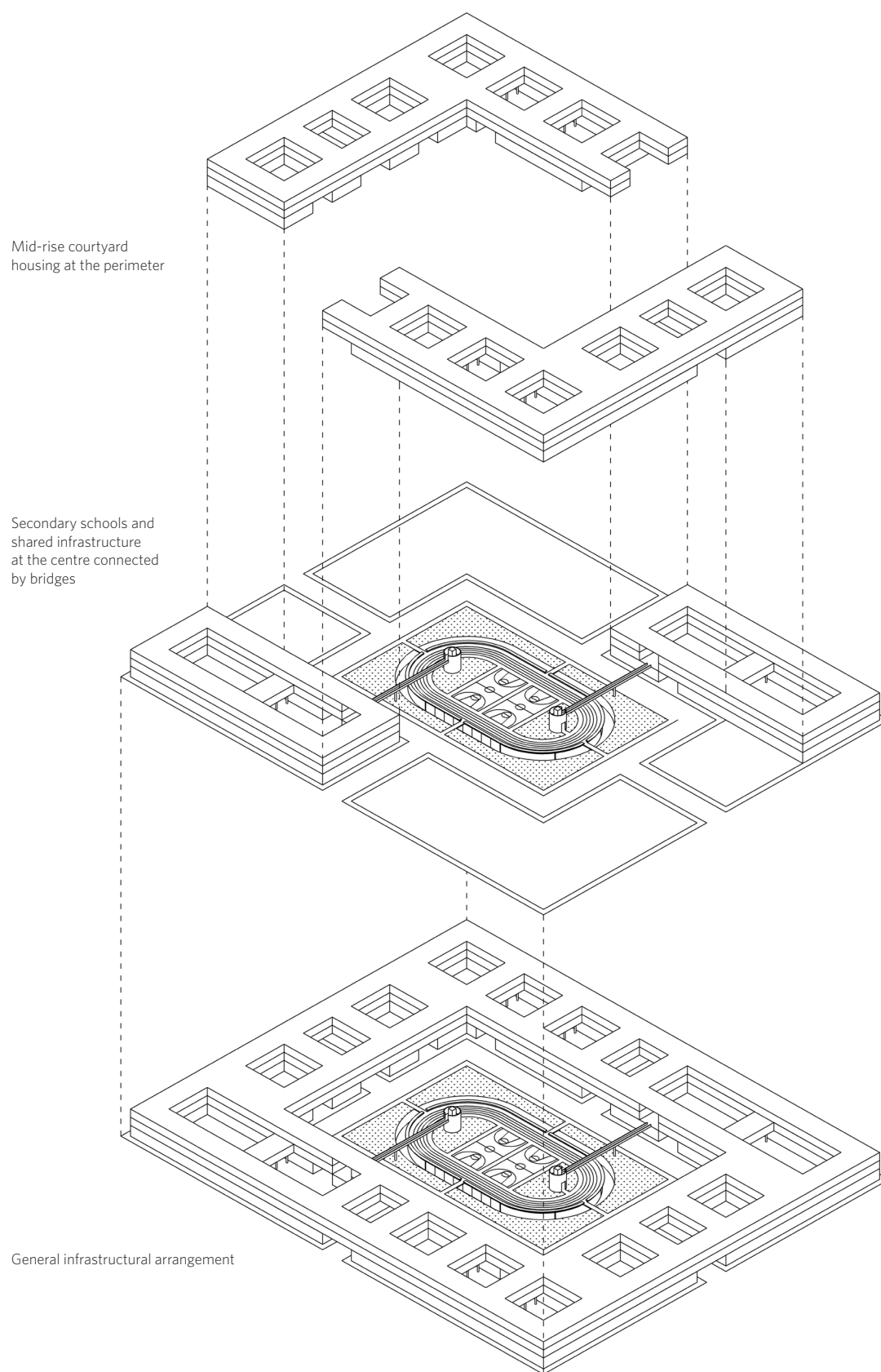
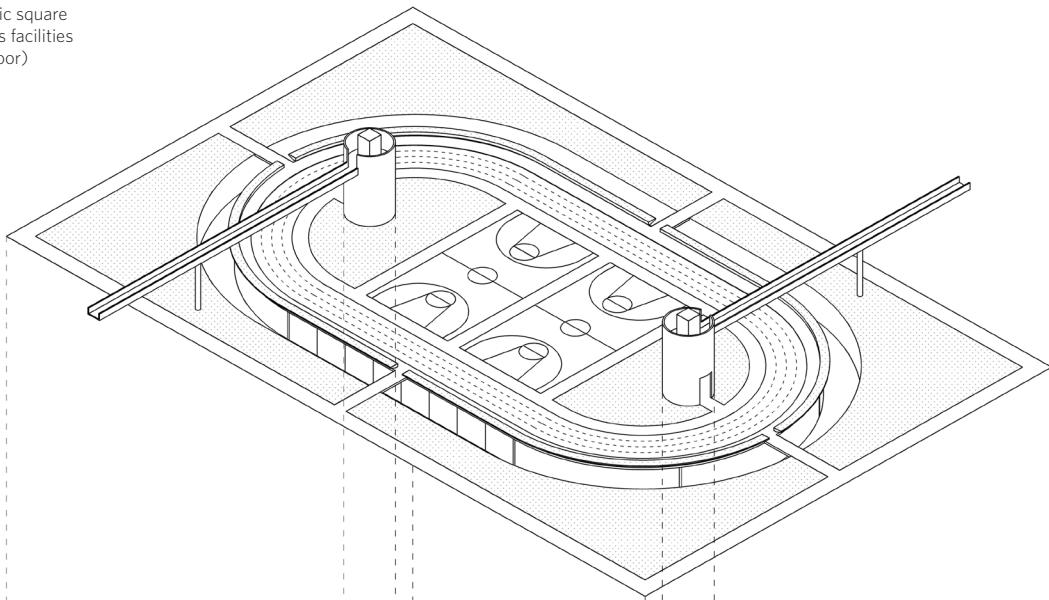
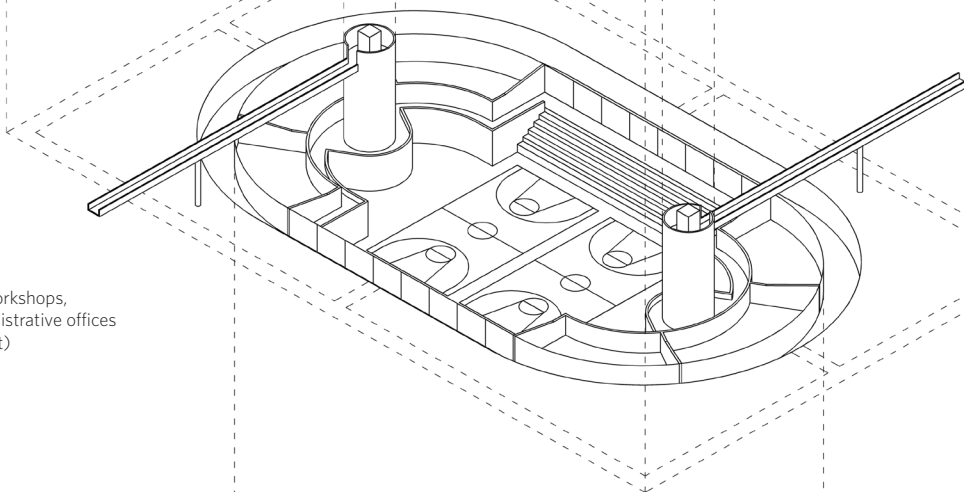


Fig. 2.23
Axonometric drawing of general infrastructural arrangement.

Semi-public square
with sports facilities
(ground floor)



Library, workshops,
and administrative offices
(basement)



Sports hall (basement)

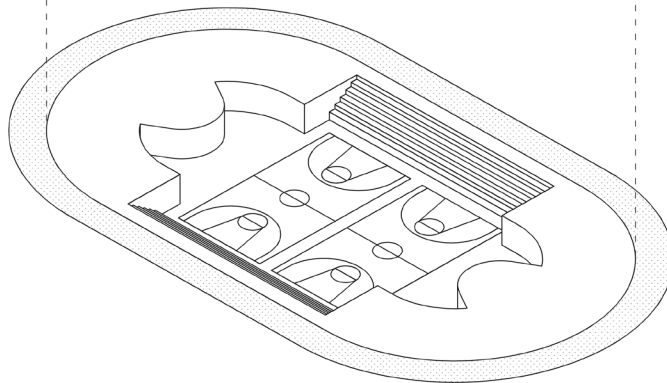


Fig. 2.24
Axonometric drawing of shared infrastructure (square, sports hall, library, workshops, and administrative offices).

Mid-rise linear housing (slab blocks)

Secondary schools and open square

General arrangement

Underground shared infrastructure

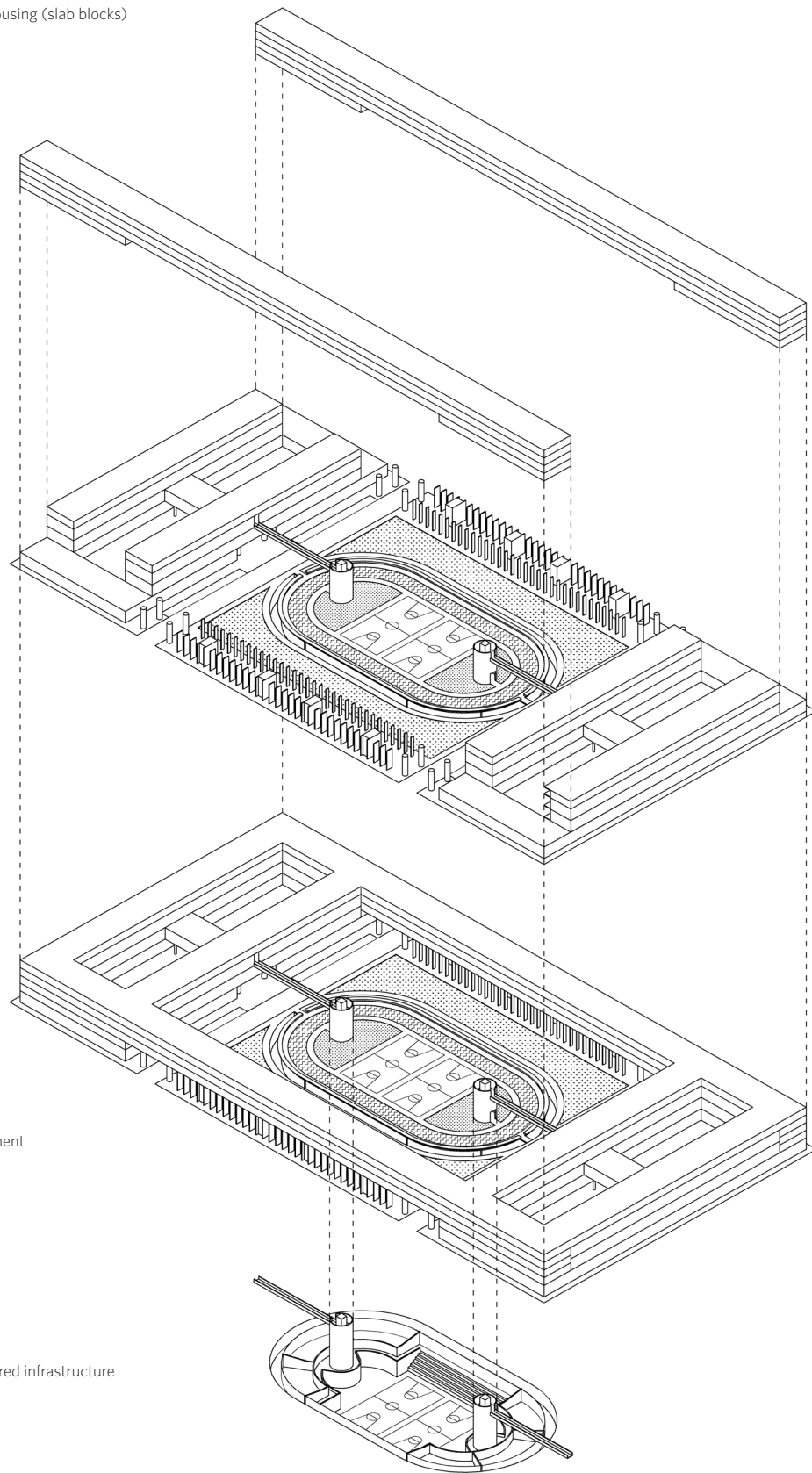


Fig. 2.25
Axonometric drawing of smaller infrastructural arrangement that follows the previously described design logic (4 40x100 m blocks).

BUILDING AND BLOCK

3

The building and block are two interrelated scales that play a key role in the creation of urban environments for housing. **The importance of thinking both scales at the same time lies in the need for both conceiving housing and small infrastructures within a comprehensive design framework and to create a transition from the private to the public domain.** In addition to this, building and block design also includes urban problems. This is because it can generate urban spaces, which implies including design concerns at larger scales.

The importance of building and block design is however underestimated by the existing regulatory framework that focuses on individual buildings. Such a biased approach to housing design is particularly problematic for low-income groups. These have been limited to a 2-storey row house configuration that is unable to incorporate mixed uses and achieve high density levels, being therefore unable to be located in central areas of the city. This problem has persisted in spite of the recent attempt by architects to rethink the row house through a design strategy that rejects mid- and high-rise housing types. The outcome is an insufficiently dense 3-storey building that fails to create block assemblies. The overall block form is determined by a random proliferation of courtyard arrangements, without considering an urban space or fabric capable of relating to other building types and infrastructures.

Based on these problems, building and block design should consider:

- The creation of dense building arrangements
- Mixed uses (including infrastructures)
- Systems of typo-morphological and functional complementarities (building hybrids)
- The creation of urban spaces (interior and exterior)
- The urban proliferation potential of building and block arrangements

Low-income groups have been limited to a 2-storey row house configuration that does not incorporate mixed uses and has problems to achieve high density levels, being therefore unable to be located in central areas of the city.

Building and block arrangement:
Two-storey row housing
in small blocks
Density: 500 p/ha

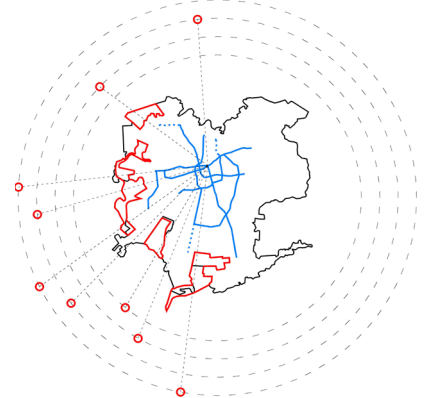
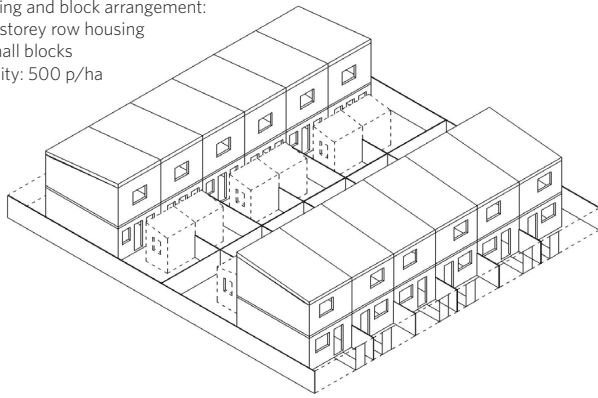
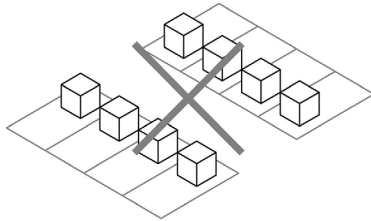


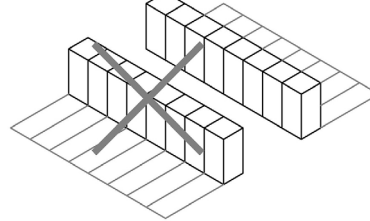
Fig. 3.1

The two-storey row house as an insufficiently dense arrangement that fosters urban sprawl.

Low-rise detached housing
(low-density)



Mid-rise linear housing
(high-density)



High-rise detached housing
(high-density)

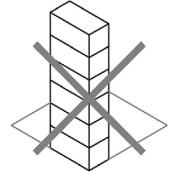
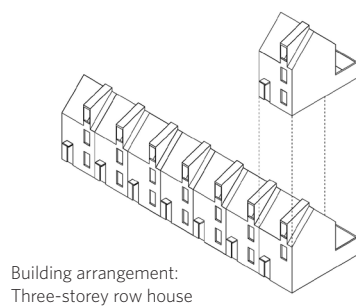


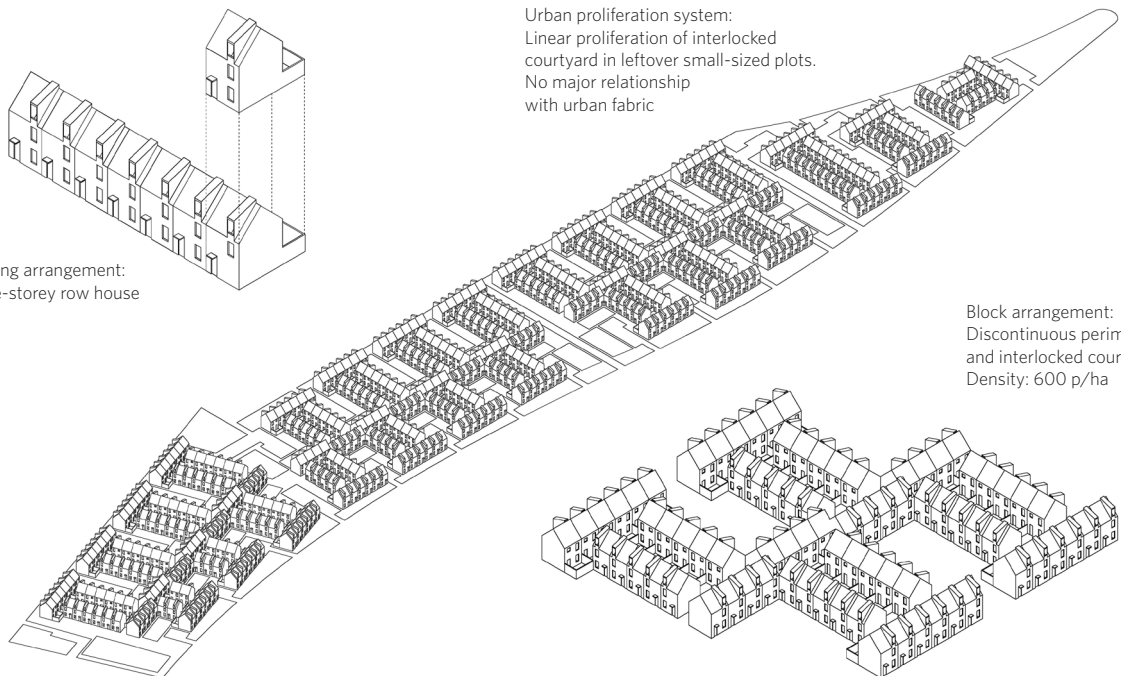
Fig. 3.2

Rejection towards housing types different from the 3-storey row house. Diagram by Elemental Architects.



Building arrangement:
Three-storey row house

Urban proliferation system:
Linear proliferation of interlocked
courtyard in leftover small-sized plots.
No major relationship
with urban fabric



Block arrangement:
Discontinuous perimeter
and interlocked courtyards
Density: 600 p/ha

Fig. 3.3

The three-storey row house and its problem to proliferate in the urban space as a block. Project by Elemental Architects.

3.2 BUILDING TYPES

The current building and block design limitations ask for a reconsideration of the main advantages and problems of the different housing types applied throughout history in Santiago. In fact, the rejection of mid- and high-rise housing types is only a recent phenomenon. This is clear looking at the history of social housing in Santiago (1910-1970), period in which a broad range of housing types were implemented, consisting of row house, slab block, and tower arrangements. **The adequate implementation of each type and their strategic combination is understood as a means to overcome existing limitations of housing design.**

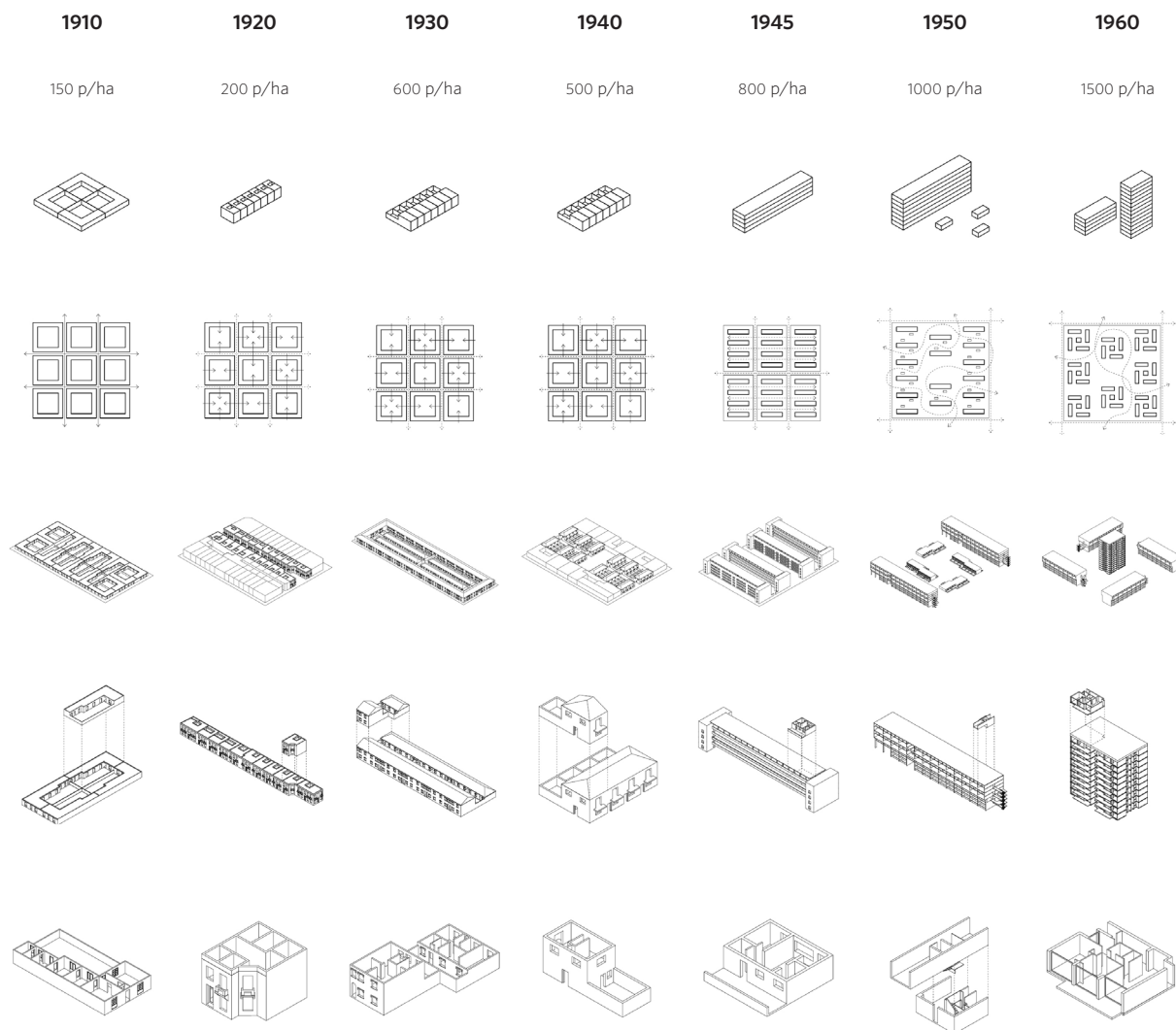
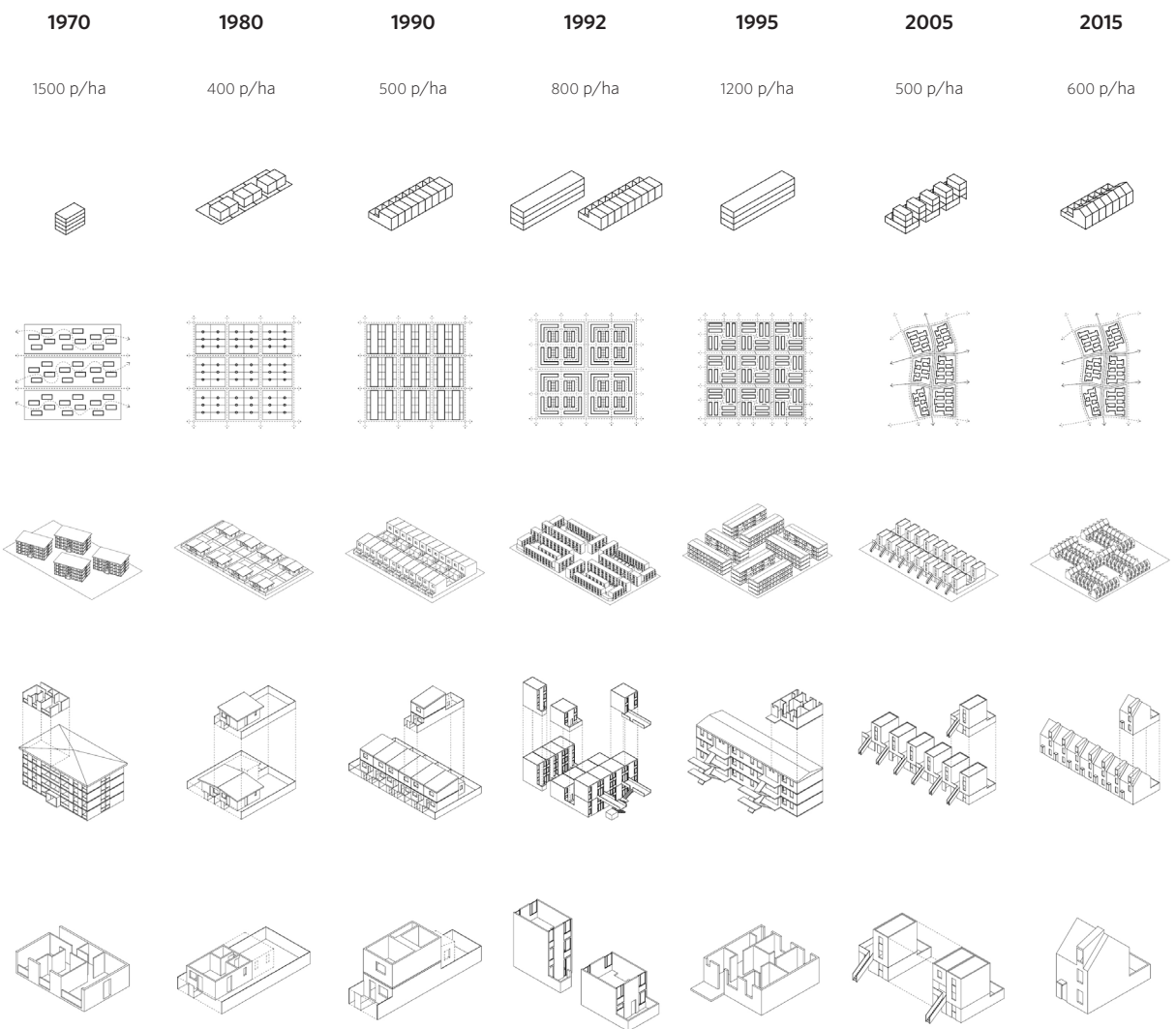


Fig. 3.4
Implementation of different housing types (row house, slab block and tower) and their resulting densities between 1910 and 1960 in Santiago de Chile. Although a range of housing typologies have been implemented throughout time, the row house - in essence a low-density solution - is nowadays the most dominant housing type, as happened during early twentieth century.



3.2.1 Row House

Current low-income housing does not account for one of the most distinctive features of early row houses (1910-1940). In this period, the row house became a mechanism to densify block interiors through pedestrian streets that formed a secondary urban fabric and communal shared spaces. Due to its ability to occupy block interiors, the row house can coexist with other building types located at the perimeter of the block. In addition, the internal streets can include small green areas that, despite being public, are virtually appropriated through visual control and maintained by dwellers at a very low cost. This building type however ceased to exist due to its inability to incorporate car parking and achieve high-density levels.

Main advantages:

- Densification of block interiors and coexistence with other building types
- Secondary (intimate) urban fabric at the interior of the block
- Low maintenance costs of communal shared spaces (green areas)
- Clear ownership of the ground floor

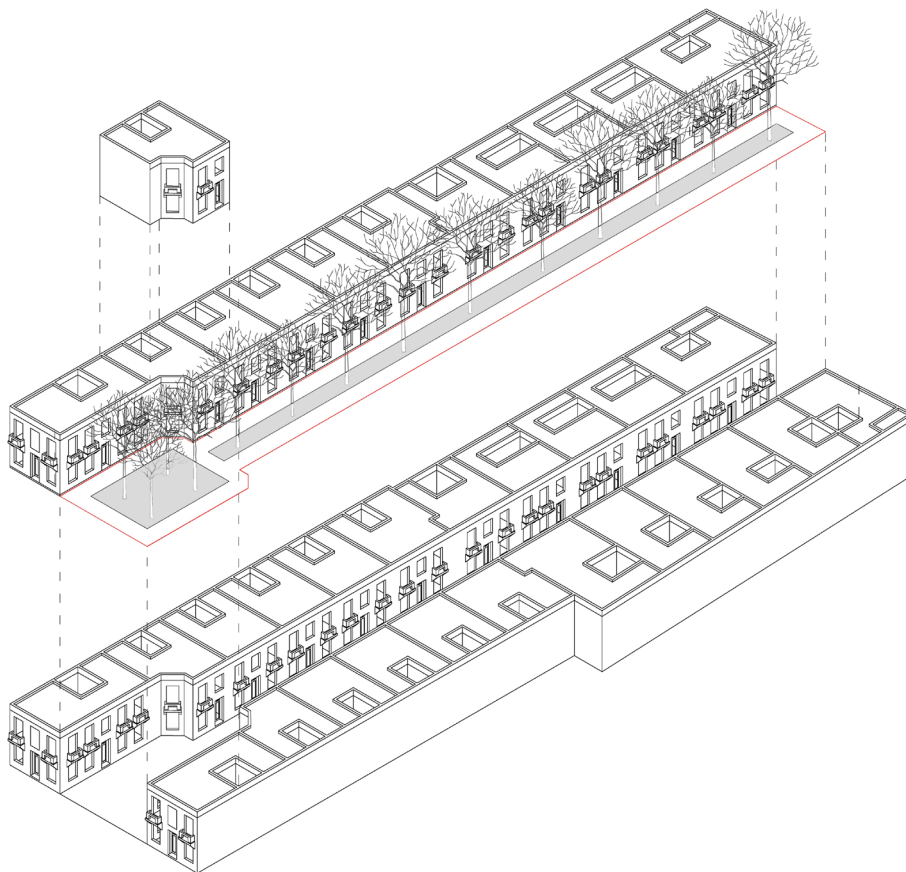
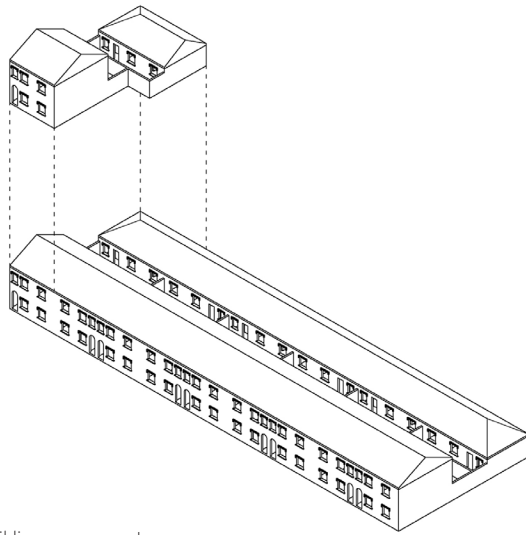
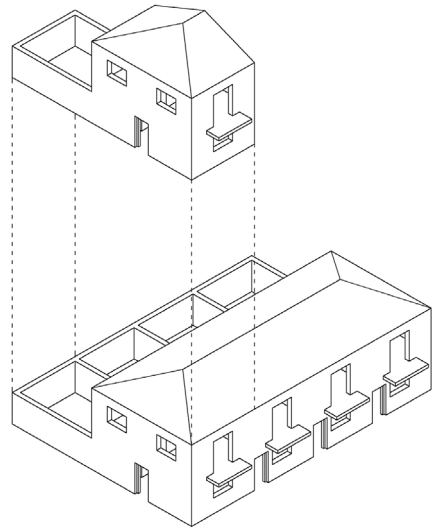


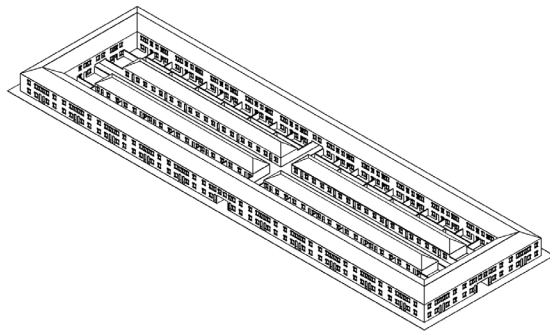
Fig. 3.5
Cité Adriana Cousiño, 1920: the street as an intermediate scale that incorporates green areas.



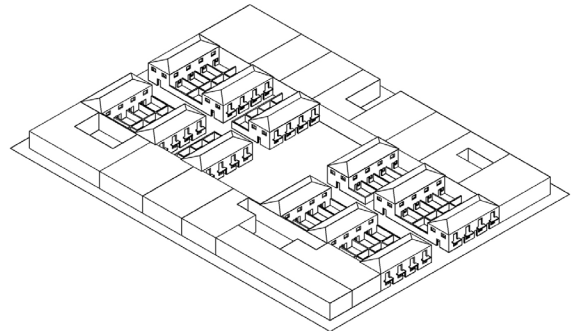
Building arrangement:
Two-storey row house



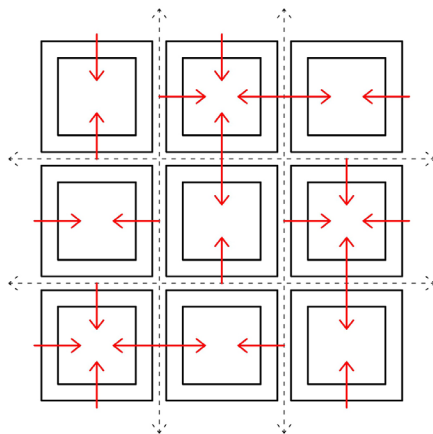
Building arrangement:
Two-storey row house



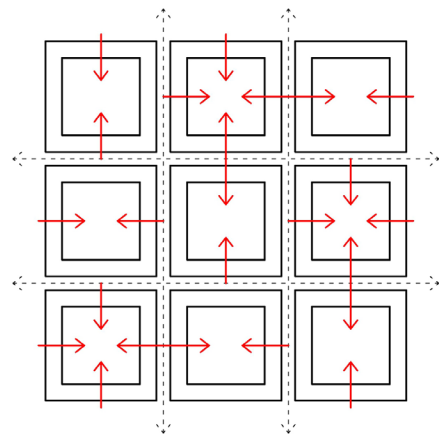
Block arrangement:
Continuous perimeter and internalized pedestrian street
Density: 600 p/ha
From: Conjunto Picarte, 1930



Block arrangement:
Internalized system of pedestrian streets (parallel row houses)
Density: 500 p/ha
From: Pasaje San Ignacio, 1940



Urban proliferation system:
Array of row houses in medium-sized blocks.
Externalized (primary) and internalized (secondary) urban fabric



Urban proliferation system:
Array of row houses in medium-sized blocks.
Externalized (primary) and internalized (secondary) urban fabric

Fig. 3.6
The row house as a building type that creates either full block (left) or internal block arrangements (right).

3.2.2 Slab Block

The slab block allows mid- to high-density levels to be achieved, which makes it a desirable housing type. What is remarkable about the slab block is its mid height – usually from 4 to 6 storeys, allowing vertical circulations without lifts – that produces building arrangements that can adapt to plot boundaries. The reason for being an abandoned housing type are the few vertical circulations versus large amounts of elevated streets and the indiscriminate proliferation of communal shared spaces inside and outside of the building, which produces ownership issues and leads to the abandonment of communal spaces. Moreover, the lack of spatial differentiation between interior and exterior spaces creates security issues that hinder interaction among neighbours. The lack of physical boundaries is also critical for the administration of buildings and maintenance of communal areas.

Main advantages:

- Dense housing solution
- Low maintenance costs of vertical circulations (no lifts)
- Versatility to adapt to block boundaries

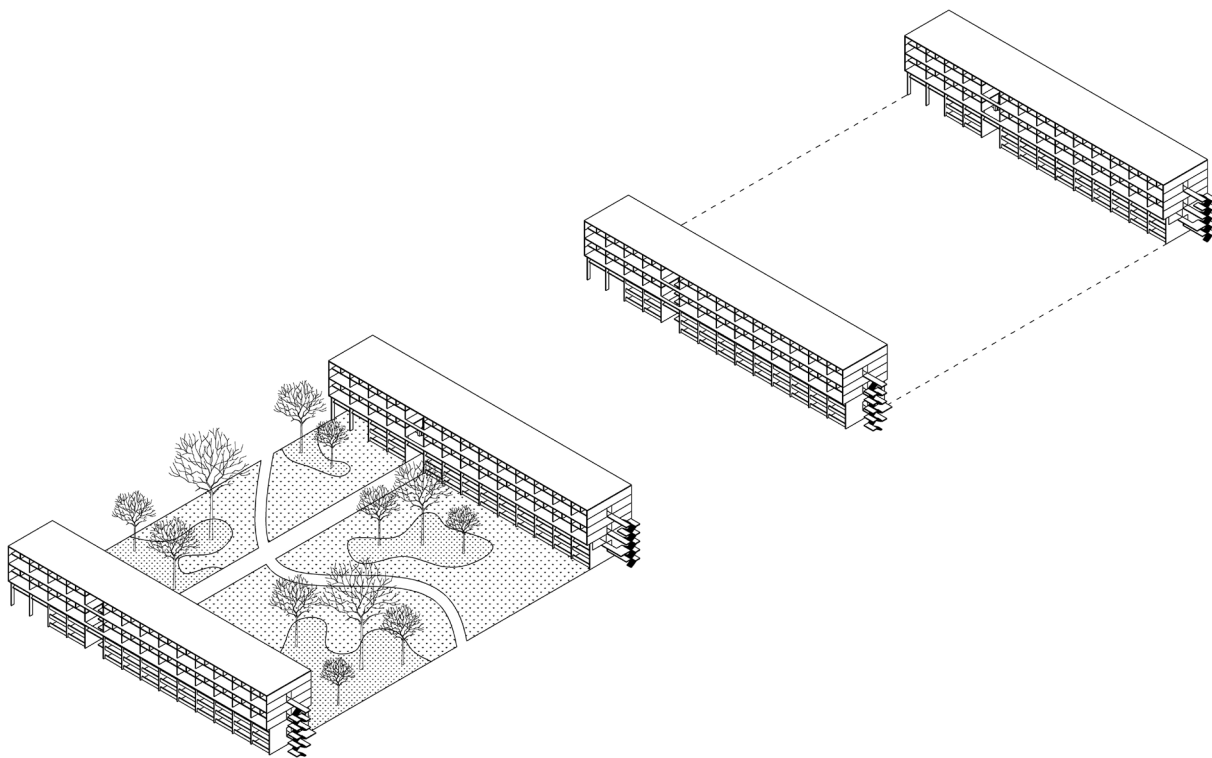
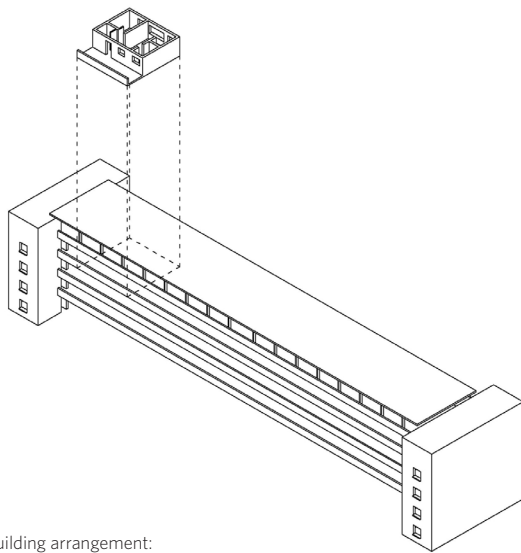
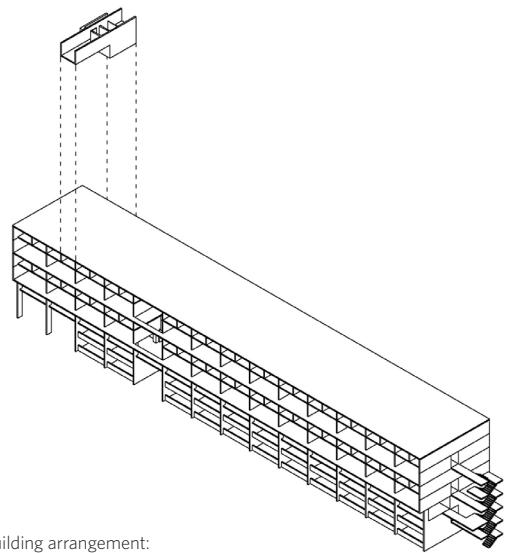


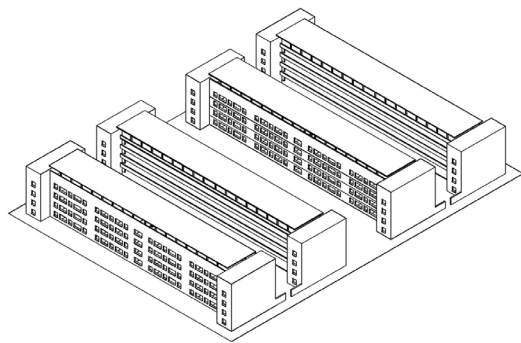
Figure 3.7
Unidad Vecinal Portales, 1950: current abandonment of communal areas due to problems of administration and maintenance.



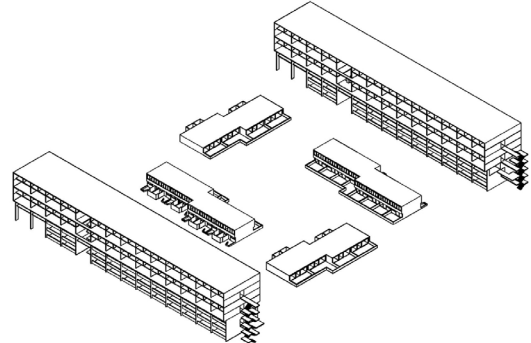
Building arrangement:
Five-storey slab block
Overlapping of elevated streets (externalized)



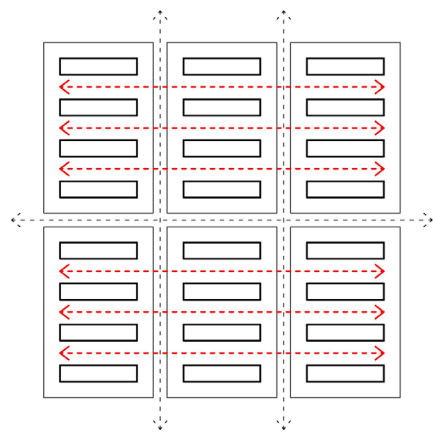
Building arrangement:
Eight-storey slab block
Overlapping of elevated streets (internalized)



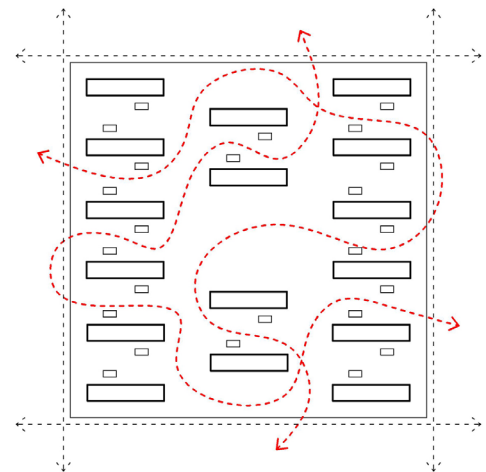
Block arrangement:
Parallel slab blocks and wide pedestrian streets
Density: 800 p/ha
From: Conjunto Hermanos Carrera, 1945



Block arrangement:
Parallel slab blocks and large central communal open space
Density: 1000 p/ha
From: Unidad Vecinal Portales, 1950



Urban proliferation system:
Array of slab blocks in medium-sized blocks.
Externalized (primary) and internalized (secondary) urban fabric



Urban proliferation system:
Interlocked slab blocks in large-sized blocks.
No major relationship with urban fabric

Fig. 3.8
The slab block as a housing type that creates either compact (left) or loose urban arrangements.

3.2.3 Tower

This housing type achieves high-density levels, being a logical choice for mass housing. One of its strengths is the efficiency of circulation, which is usually concentrated in one area of the building. In spite of that, the tower is considered unaffordable for low-income groups because of the high maintenance costs of lifts. This makes the tower a housing type that can only be afforded by mid- and high-income groups. In addition to this problem, the tower has a problematic relationship with the ground due to its limited coverage and the needed setbacks between high-rises in order to ensure natural day lighting. This originally created an open urban arrangement that produced ownership problems on the ground floor. Equally problematic are current developments, which are towers surrounded by fences that impede the provision of infrastructure at the boundaries of the plot.

Main advantages:

- Dense housing solution
- Efficiency of vertical circulations

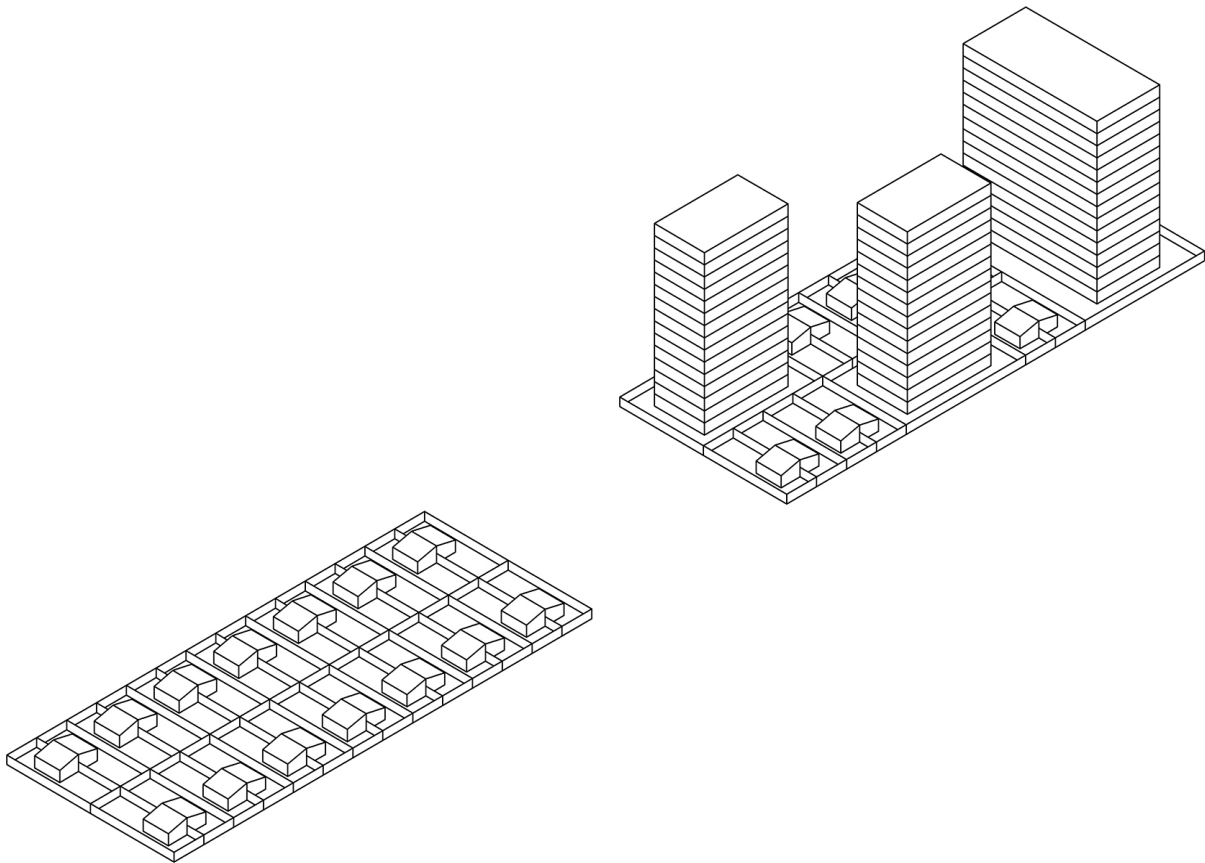
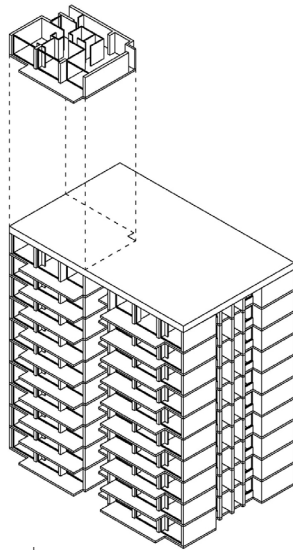
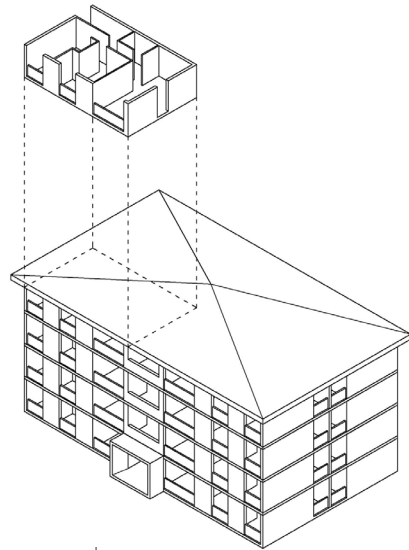


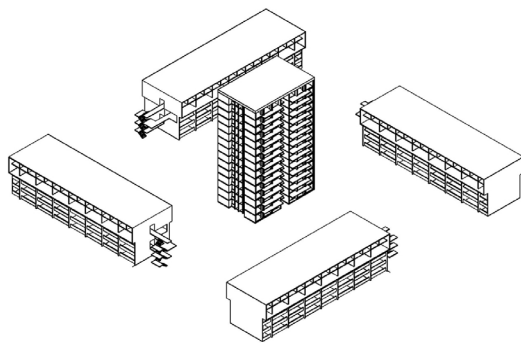
Figure 3.9
Generic current solution (2017): proliferation of individual tower arrangements in small blocks (example of 40x100 m block).



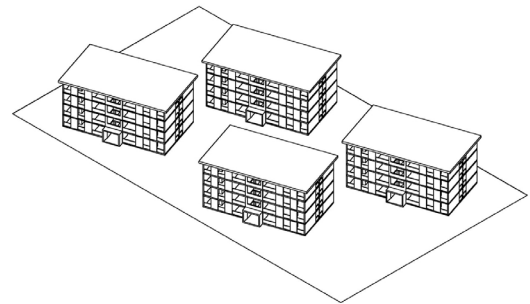
Building arrangement:
High rise tower (10-20 storeys)
Overlapping of dwellings around a vertical core



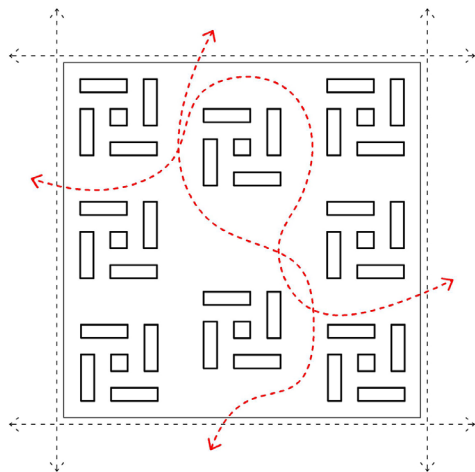
Building arrangement:
Mid-rise tower (4-9 storeys)
Overlapping of dwellings around a vertical core



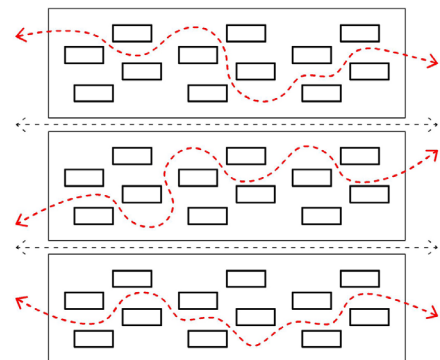
Block arrangement:
Isolated high-rise tower and undefined communal open space
Density: 1500 p/ha
From: Villa Frei, 1960



Block arrangement:
Interlocked mid-rise towers and undefined communal open space
Density: 1500 p/ha
From: Bloques Sociales, 1970



Urban proliferation system:
Interlocked towers in large-sized blocks.
No major relationship with urban fabric



Urban proliferation system:
Interlocked towers in mid-sized blocks
No major relationship with urban fabric

Fig. 3.10
The tower as a housing type that has problems defining the ground floor.

3.3 PRIMARY BUILDING CRITERIA

To resolve the above discussed problems, it is necessary to define primary criteria for building design. Thus, all housing solutions should fulfil the following criteria:

- High-density
- Access to natural day light
- Built perimeter (in order to accommodate infrastructure)
- Clearly defined internal open spaces

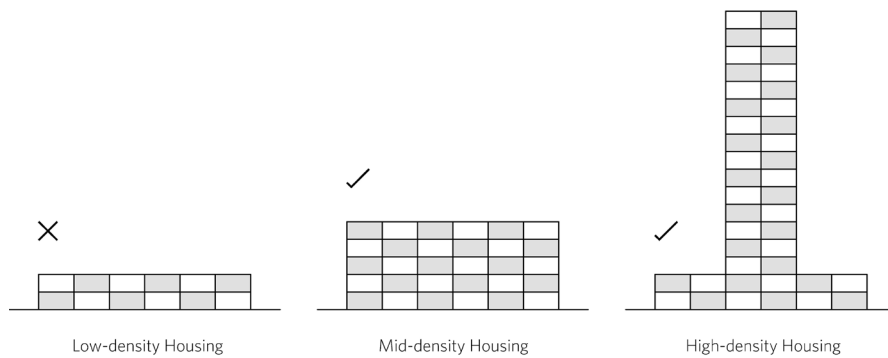


Fig. 3.11
Density ranges.

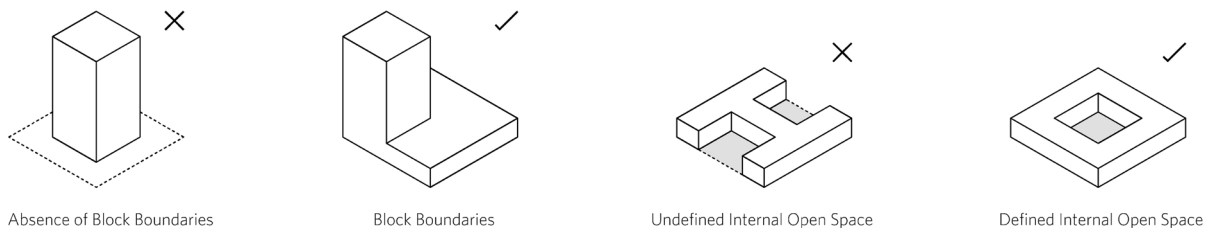


Fig. 3.12
Block boundaries.

Fig. 3.13
Built perimeter.

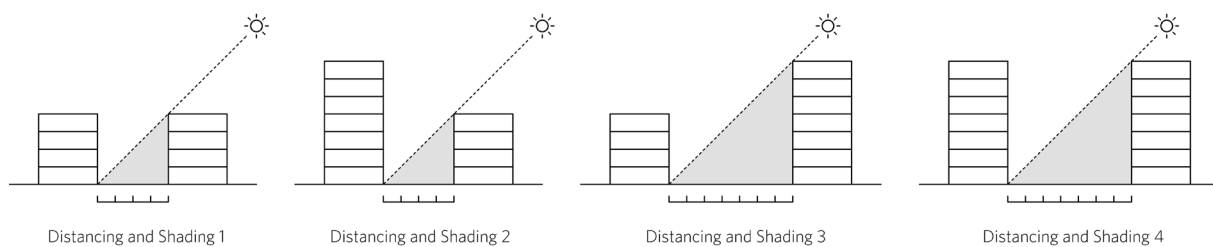


Fig. 3.14
Access to natural day light.

3.4 FORMS OF HOUSING AND BUILDING TYPES

Acknowledging socio-economic limitations through a system that recognizes different forms of housing (social, affordable, and private) means for building design that **housing types do not belong to specific income groups. Consequently, each form of housing can be independently applied in row house, tower or slab block arrangements.** However, in the case of social and affordable housing, these should be subject to additional funding if they are applied in high-rises – and thus pay for the maintenance of lifts and internal shared spaces. On the other hand, when private housing is required to include percentages of social or affordable housing, this can, for example, combine high-rises (private housing) with low maintenance types like row housing. Based on the above, instead of choosing one type for a specific form of housing, a range of building assemblies resulting from the combination of row houses, towers, and slab blocks is proposed. These respond to the following dispositions within plots:

- Perimeter
- Centre
- Perimeter and centre
- Housing density of at least 1,000 p/ha

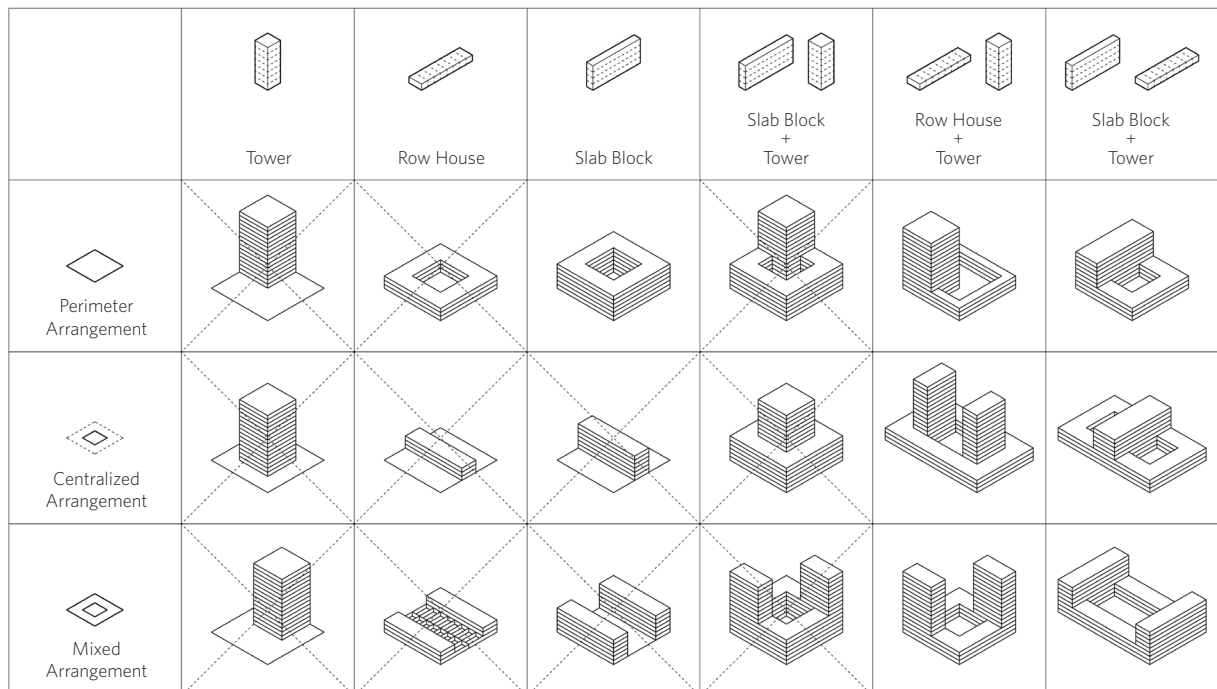


Fig. 3.15
Matrix of building arrangements according to different building types and their disposition in the plot.

3.5 SECONDARY BUILDING DESIGN CRITERIA

With the typological ranges already defined, it is possible to ask for further design criteria:

- Hidden car parking areas
- Mixed uses
- Minimum of horizontal circulations
- Visual and physical relationship with the street

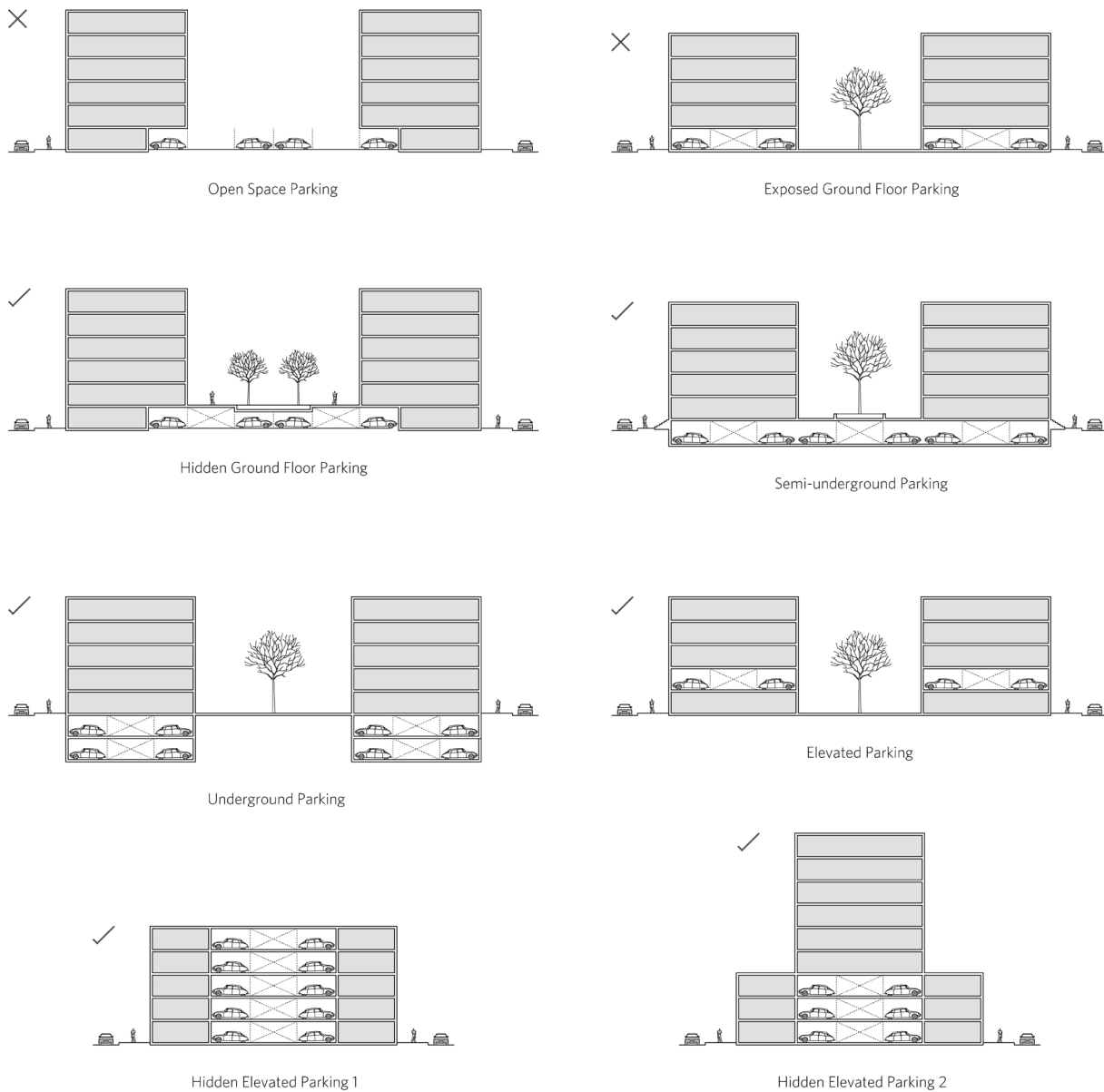


Fig. 3.16

Design criteria for parking areas: cars should not be part of the landscape both outside and inside of the block in dense residential areas. To address this problem, parking areas can be hidden at the underground level, ground floor level, or upper floor levels.

- Mid-rise or High-rise Housing
- Row Housing
- Parking Area
- Commercial Area
- Offices
- Other Uses (Educational or similar)

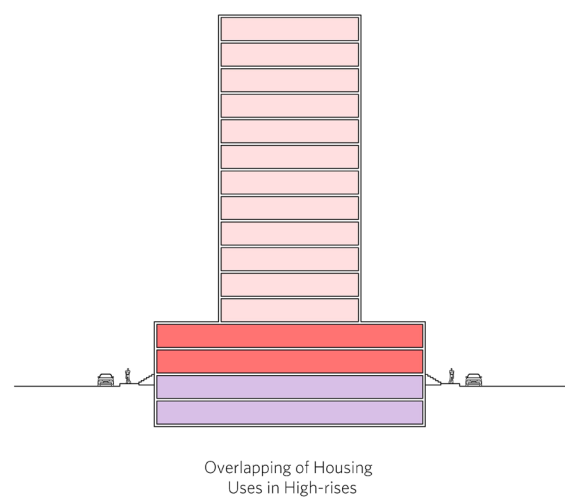
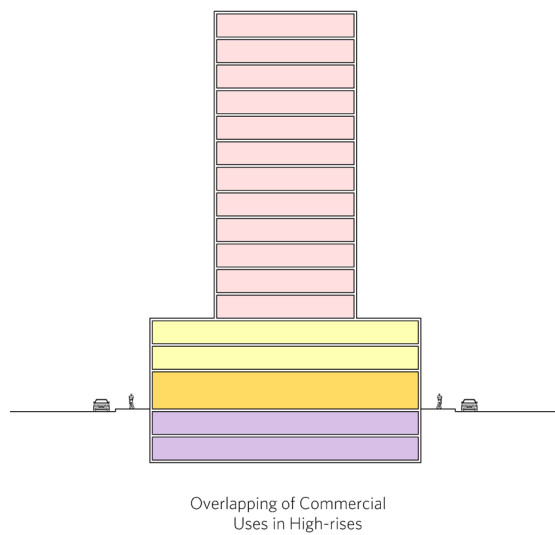
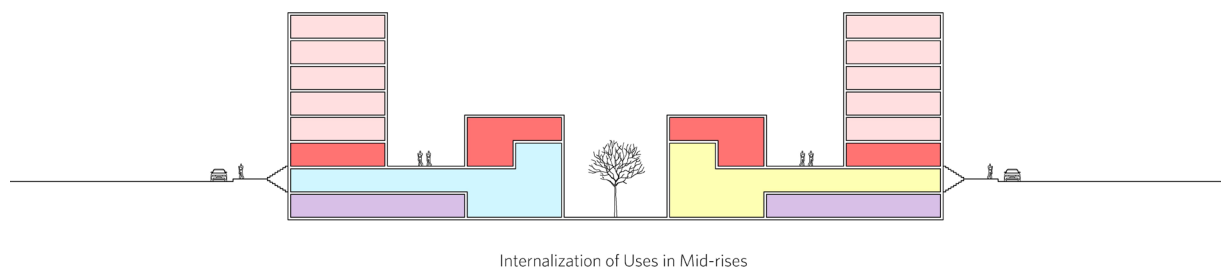
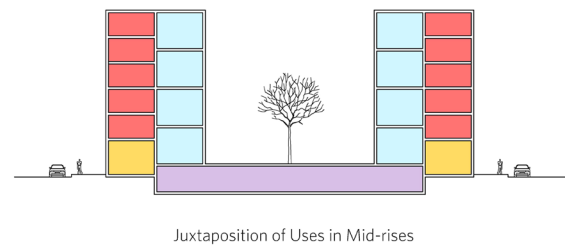
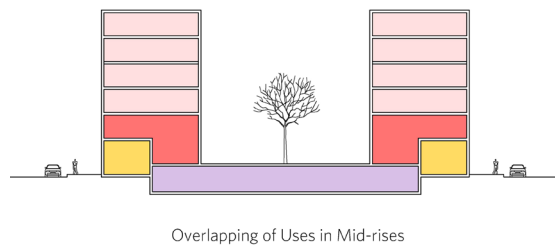
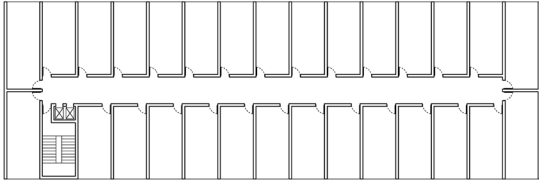


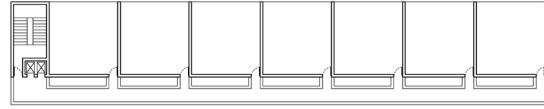
Fig. 3.17
Design criteria for mixed uses: housing can integrate other programmes in multiple ways through horizontal, vertical, or mixed arrangement of different functions, whose combination can create permeable (open interiors) or non-permeable building arrangements.

✗



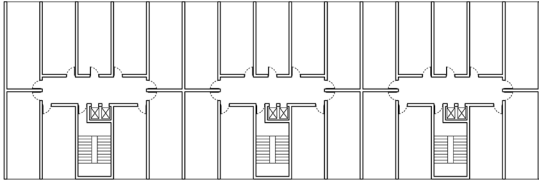
Interior Elevated Street

✗



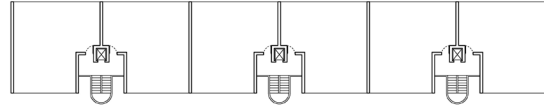
Exterior Elevated Street

✓



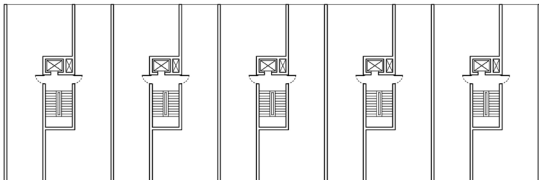
Short Horizontal Circulations

✓



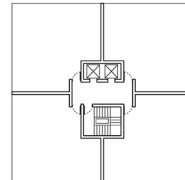
Multiple Exterior Vertical Circulations

✓



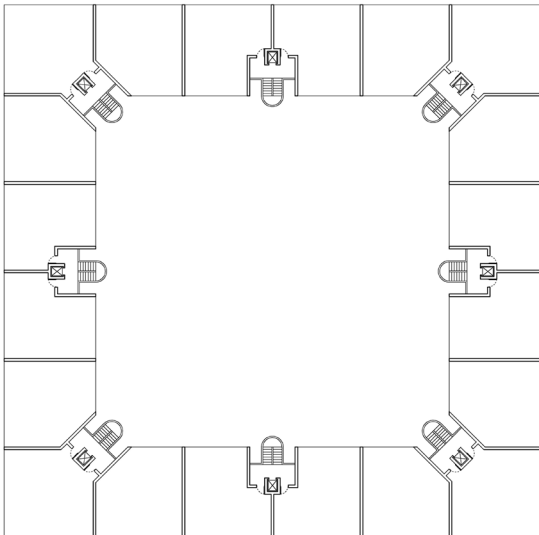
Multiple Interior Vertical Circulations

✓



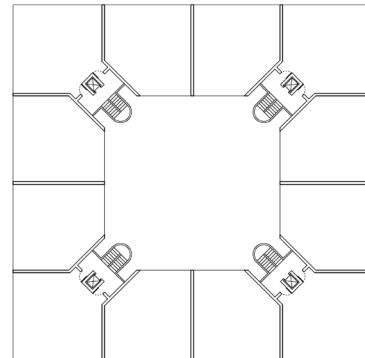
Vertical Circulation Core

✓



Corner and Central Vertical Circulations

✓

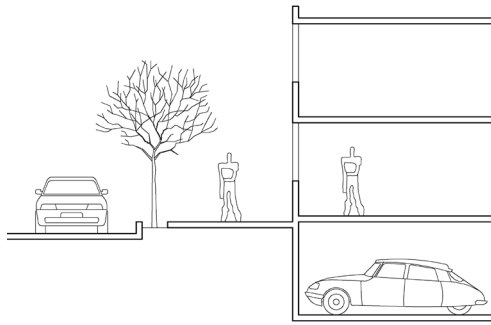


Corner Vertical Circulations

Fig. 3.18

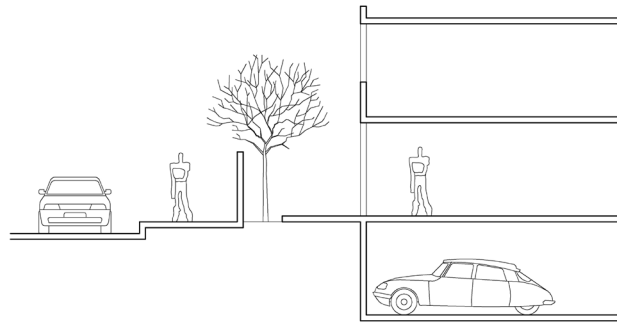
Design criteria for minimum horizontal-elevated circulations: long circulations can create ownership, privacy, and security issues. To avoid these problems, vertical circulations are recommended. The number of circulations will depend on the building arrangement.

✗



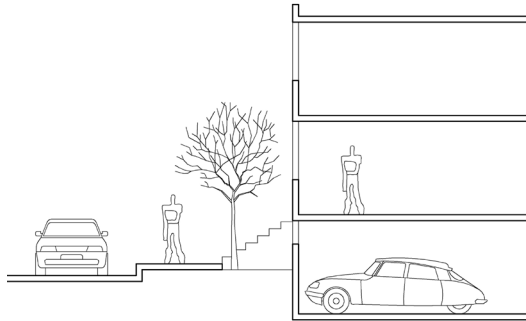
Ground Floor Housing

✗



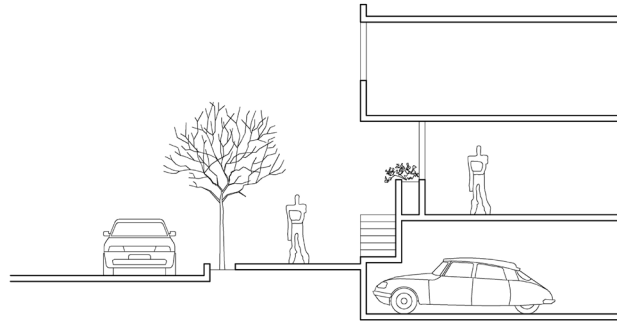
Front Yard and Ground Floor Housing

✓



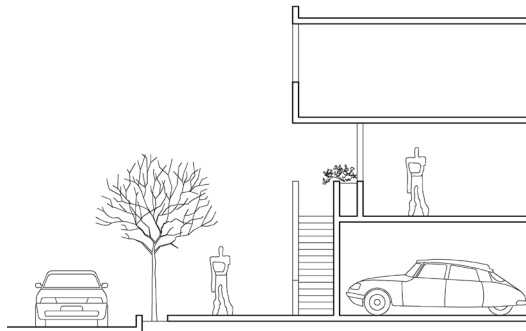
1/2 Floor Housing Option 1

✓



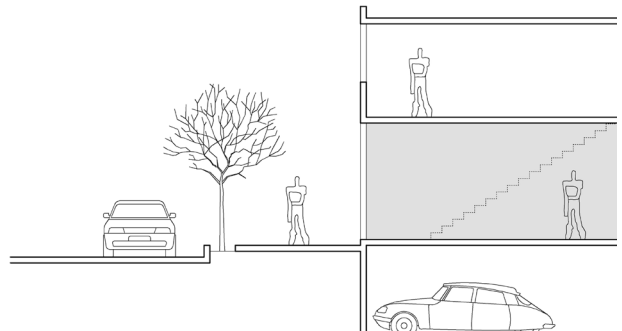
1/2 Floor Housing Option 2

✓



1st Floor Housing

✓



Commercial Ground Floor and 1st Floor Housing

Fig. 3.19

Design criteria for visual and physical relationship with the street: providing privacy and security to dwellings close to the ground floor is an important aspect to consider. Answering this problem is possible by raising dwellings 1/2 or 1 floor.

3.6 SOCIO-EDUCATIVE FACILITIES

Socio-educative infrastructure is not just another design criteria to consider for building design but plays a key role in the organization of housing assemblies. Each building compound should be provided with at least one of these facilities. **The Socio-educative space should be arranged in such a way that establishes a hierarchical visual and physical relationship with the main communal open space.** In doing so, the latter becomes an extension of the socio-educative facility, which is also seen as a mechanism to create a sense of belonging, security, and coexistence among neighbours.

- Socio-Educative Facility
- Communal Open Space

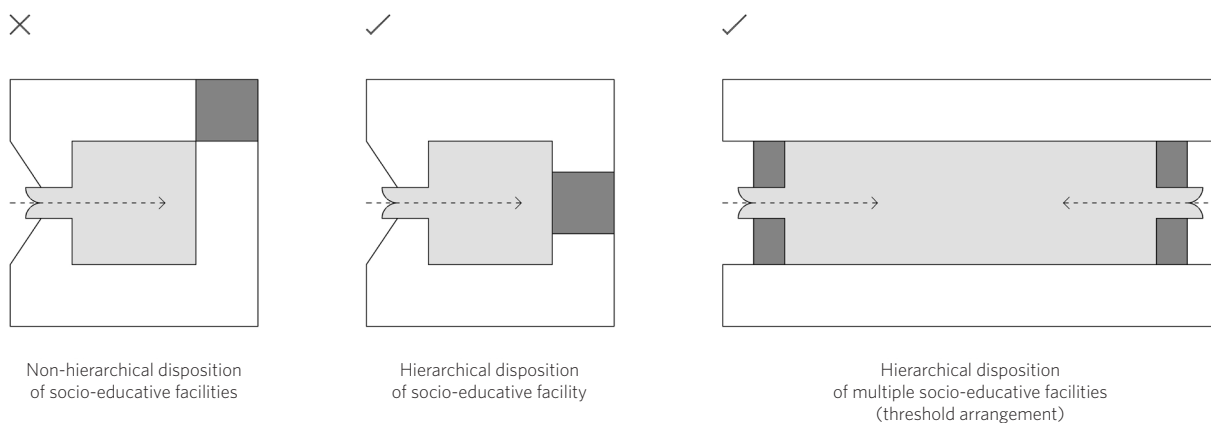


Fig. 3.20
Disposition of socio-educative facilities in relation to communal open space.

3.7 SPATIAL-ADMINISTRATIVE LIMITS AND ACCESSES

Considering that buildings compounds are complex agglomerations of functions, programmes, and forms of housing, it is necessary to provide clear spatial-administrative limits to each of them in order **to avoid confusions with issues of ownership, maintenance, privacy, and security. Responding effectively to these is largely determined by the provision of physical (architectural) boundaries and independent access from the street (either vehicular or pedestrian).** This is particularly important for the provision of socio-educative facilities and communal open spaces, which have to be, above all, safe places. Moreover, by providing street access to socio-educative facilities it is possible to include neighbours coming from different areas of the block or buildings that have no access to the main communal open space.

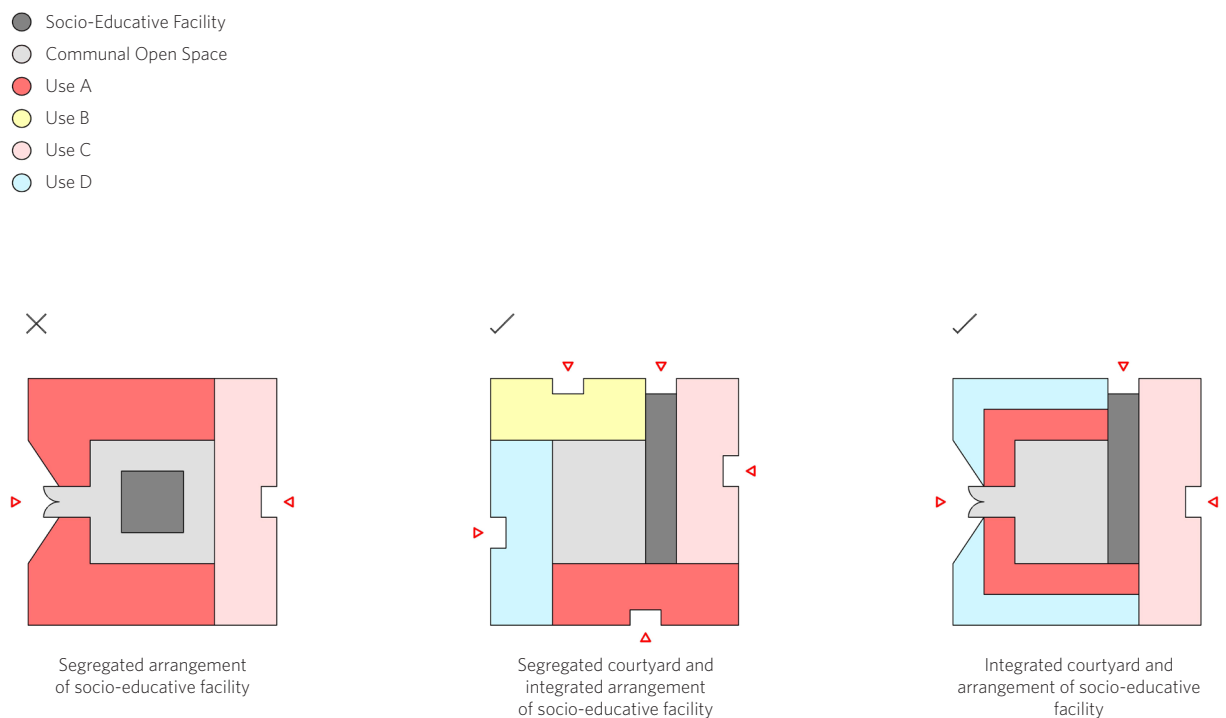


Fig. 3.21
Arrangement of different functions-uses and accesses.

3.8 BLOCK TYPES

The proposed buildings are to be applied at the block scale. They are not isolated solutions but design elements allowing for spatial and functional compatibilities in order to produce larger arrangements. Thus, small components determine the system of general assemblage, which means that the building and block scales are interrelated. **Although the block can be the outcome of a sum of buildings, its larger scale allows introducing other uses and design strategies that can generate urban streets and squares either at its interior or exterior.** This means that the architectural qualities of the block have a direct impact on the formation of urban patterns that can be reproduced throughout the city. Thus, the same way as buildings, the block is also an infrastructural component and therefore it has to be understood as an essential scale in urban design. From this idea, it is possible to find a matrix of high-density building arrangements responding to:

- Small Blocks
- Linear Blocks
- Medium Blocks
- Large Blocks


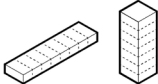
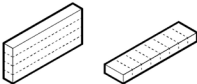

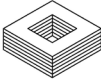
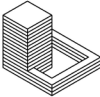
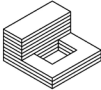

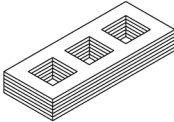
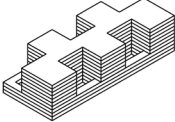
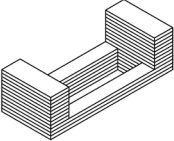

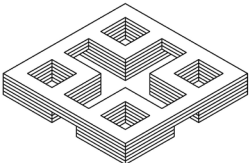
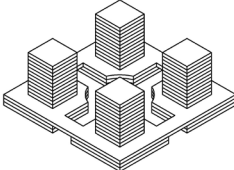
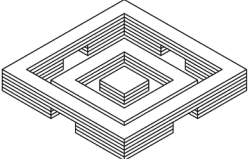

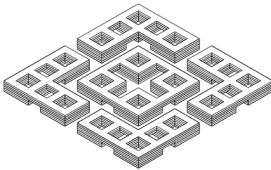
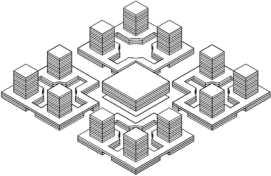
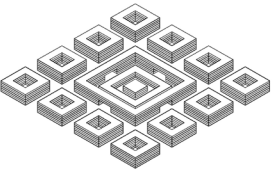
	 <p>Slab Block</p>	 <p>Row House + Tower</p>	 <p>Slab Block + Row House</p>
 <p>Small Block 40x40 meters</p>	 <p>Average Density 1700 p/ha</p>	 <p>Average Density 1700 p/ha</p>	 <p>Average Density 1700 p/ha</p>
 <p>Linear Block 40x100 meters</p>	 <p>Average Density 1500 p/ha</p>	 <p>Average Density 2000 p/ha</p>	 <p>Average Density 1600 p/ha</p>
 <p>Medium Block 100x100 meters</p>	 <p>Average Density 1300 p/ha</p>	 <p>Average Density 1800 p/ha</p>	 <p>Average Density 1300 p/ha</p>
 <p>Large Block 200x200 meters</p>	 <p>Average Density 1300 p/ha</p>	 <p>Average Density 1400 p/ha</p>	 <p>Average Density 1200 p/ha</p>

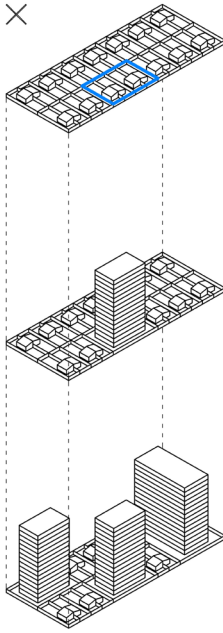
Fig. 3.22
Matrix of block arrangements according to different block sizes and combination of building types.

3.9.1 Small-size Blocks

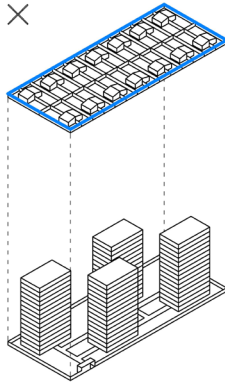
A significant amount of blocks in central areas of Santiago are of small dimensions. The reason for this is semi-detached and row houses of 1 to 2 storeys. These create mono-functional residential blocks, whose width range between 30 and 60 meters, leaving a length that varies from 60 to 250 meters. In these cases, plots have to be large enough to accommodate communal open spaces. To make this possible, plots need to cover their entire width. This results in the linear disposition of individual building arrangements, among which it is possible to complete the entire block.

Completing the block in fragments can allow for the inclusion of small housing agents in the design process. However, the block can also be designed as an entire unit. This requires larger efforts by private agents or a state-driven housing development. The block can be either a large residential complex or a mix of housing with integrated infrastructures. These can be, among others, a primary school or other educational programmes, municipal buildings, and sport or cultural facilities.

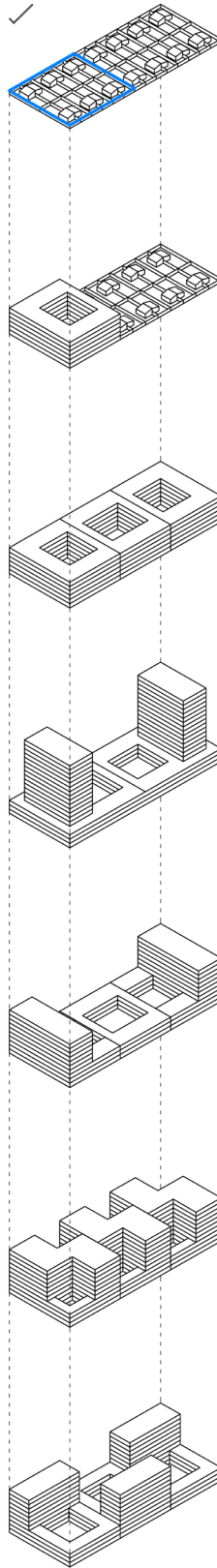
Development in Fragments



Full Block Development



Development in Fragments



Full Block Development

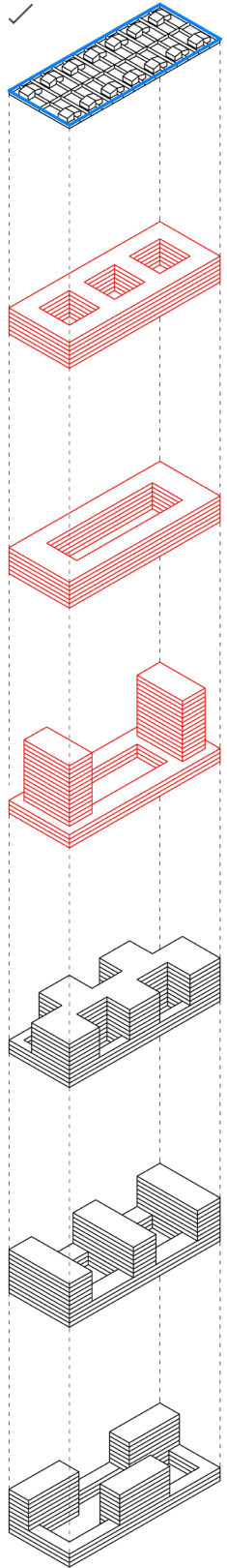


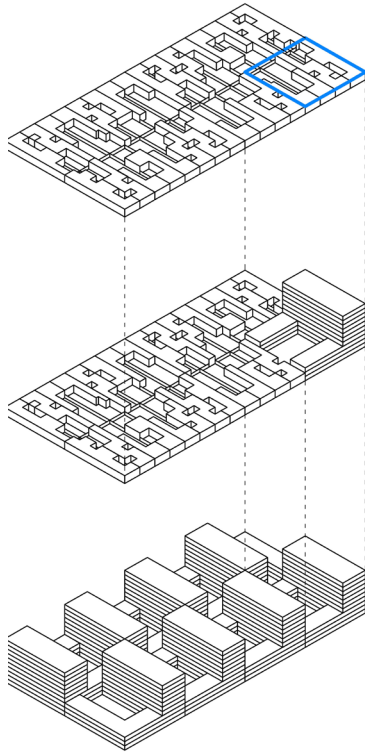
Fig. 3.23

Different arrangements for the development of a 40x100 meters block in fragments and as an entire unit (in red example to be developed in detail).

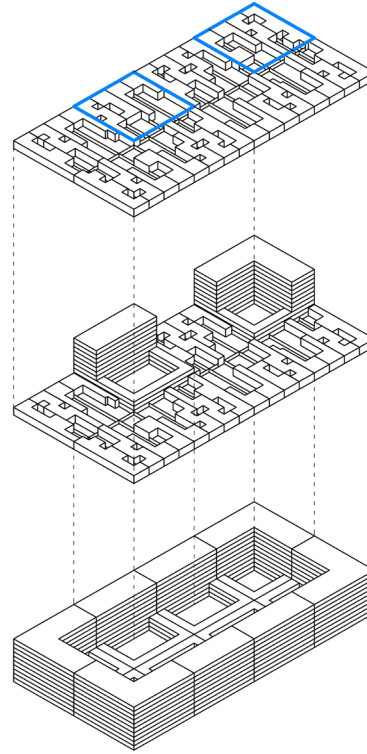
3.9.2 Mid-size Blocks

Mid-size blocks are typical for housing developments of the first half of the twentieth century. The usual width for a mid-size block ranges from 80 to 120 meters, whereas the length from 100 to 200 meters. The block can be conceived in fragments or as a whole. However, due to its scale, it is more likely that the block is made up of smaller units with access to only one street. One of the difficulties of dealing with a mid-size block is its interior. This is evident when looking at the grain of the block, whose most common example is a narrow and long row house with internal courtyards and a backyard. The inefficient use of the ground floor translates into low-density levels that allow occupying the block interior with extensions to existing dwellings or a change from residential to semi-industrial uses – such as garages. **To address the depth of the block adequately, architects can introduce pedestrian streets and courtyards in order to achieve high-density and ensure the provision of communal open spaces and infrastructures.** This strategy of block design is an opportunity to organize infrastructure differently. Thus, it can be arranged in the block perimeter (externalized) or, conversely, agglomerated in the interior.

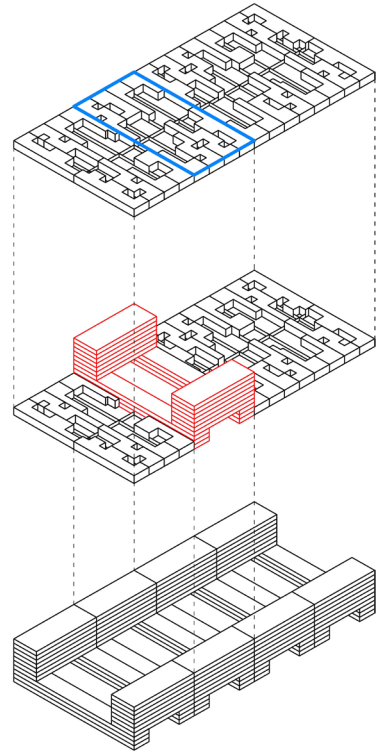
Small Block Fragments



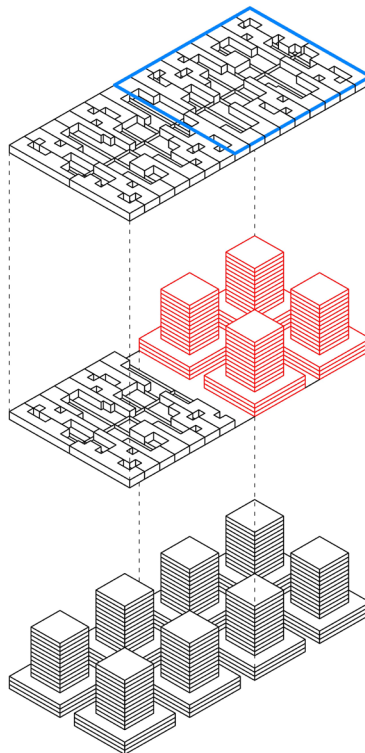
Differentiated Small Block Fragments



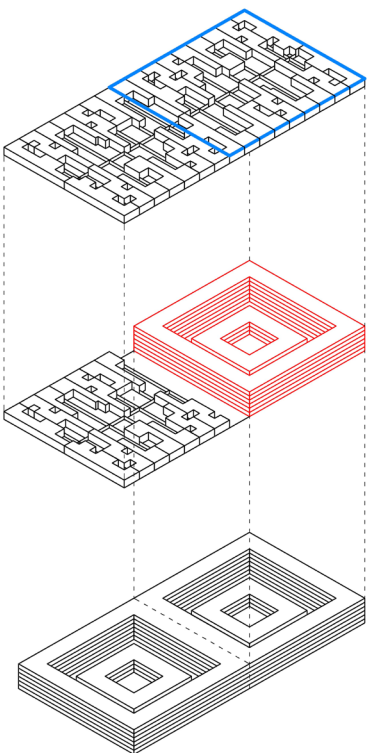
Medium Block Fragments



Differentiated Medium Block Fragments



Medium Block Fragments



Semi-differentiated Medium Block Fragments

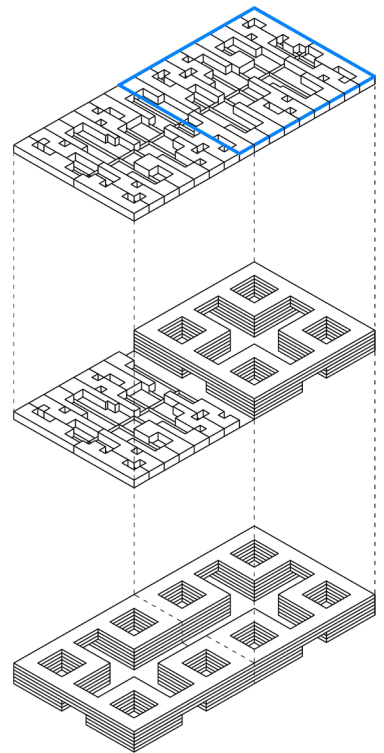
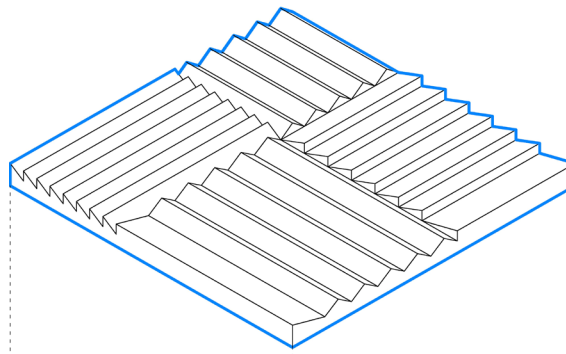


Fig. 3.24
Different arrangements for the development of a 80x160 meters block in small, medium, and large fragments (in red example to be developed in detail).

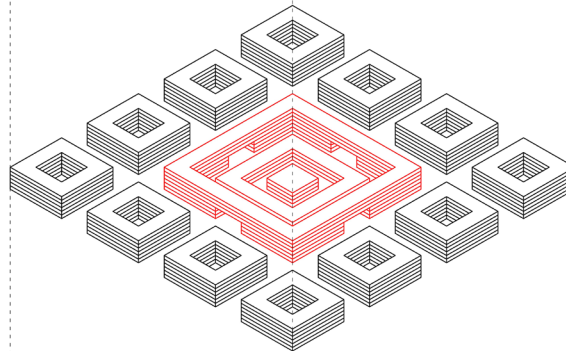
3.9.3 Large-size Blocks

Large-size blocks are not common in central areas of Santiago. They mainly consist of industrial buildings whose dimensions usually vary from 200 to 300 meters on each side. To apply this block type, a legal framework capable of enforcing the relocation of industrial activities in peripheral areas of the city is needed, either for private or public developments. In either of these cases, a large-scale investment is required that can provide not only housing but also a mid-scale infrastructure. The latter can be a commercial centre or other private programmes on the one hand, or a public programme such as a civic centre, concert hall, or mid-scale hospital on the other. In terms of the design strategies for the combination of housing and infrastructure, **the block requires a subdivision in order to access its interior and create clear administrative limits for housing areas. This can be achieved by including not only pedestrian but also vehicular streets at the perimeter.** Such a strategy would allow it to connect with the existing fabric, reducing the scale from a large-sized block to a system of small or mid-sized blocks – depending on the typical block sizes of the surroundings.

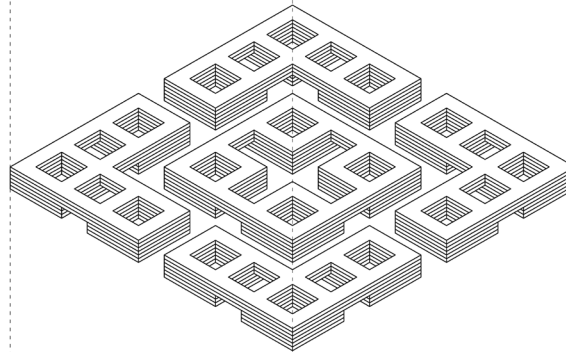
Example of a typical industrial block arrangement



Mid-rise housing block with differentiated perimeter and centralized circuit



Mid-rise housing block with semi-differentiated perimeter and axial centre



High-rise housing block with semi-differentiated perimeter and centralized infrastructure

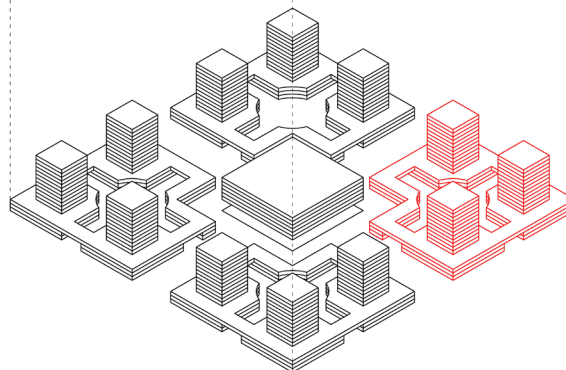


Fig. 3.25
Different arrangements for the development of a 200x200 meters block according to small and medium block grains (in red example to be developed in detail).

3.10 BUILDING AND BLOCK DESIGN EXAMPLES

From the different block sizes, some of the suggested diagrammatic possibilities can be developed in more detail. This is with the intention of showing concrete outcomes from the implementation of building and block design principles. **The reason for choosing the following 6 examples are their organizational structures. Apart from being determined by different building types, each example produces a specific urban fabric and therefore a system of urban proliferation.** Thus, they embody a logic not only for producing buildings of different sizes but also, and more importantly, for urban design. The examples address the following approaches:

- **Example 1:** Linear Courtyard
- **Example 2:** Multi-Courtyard Housing Block
- **Example 3:** Inner Block Circuit
- **Example 4:** High-Rise Courtyard Block
- **Example 5:** Inner Block Street
- **Example 6:** Inner Block Grid

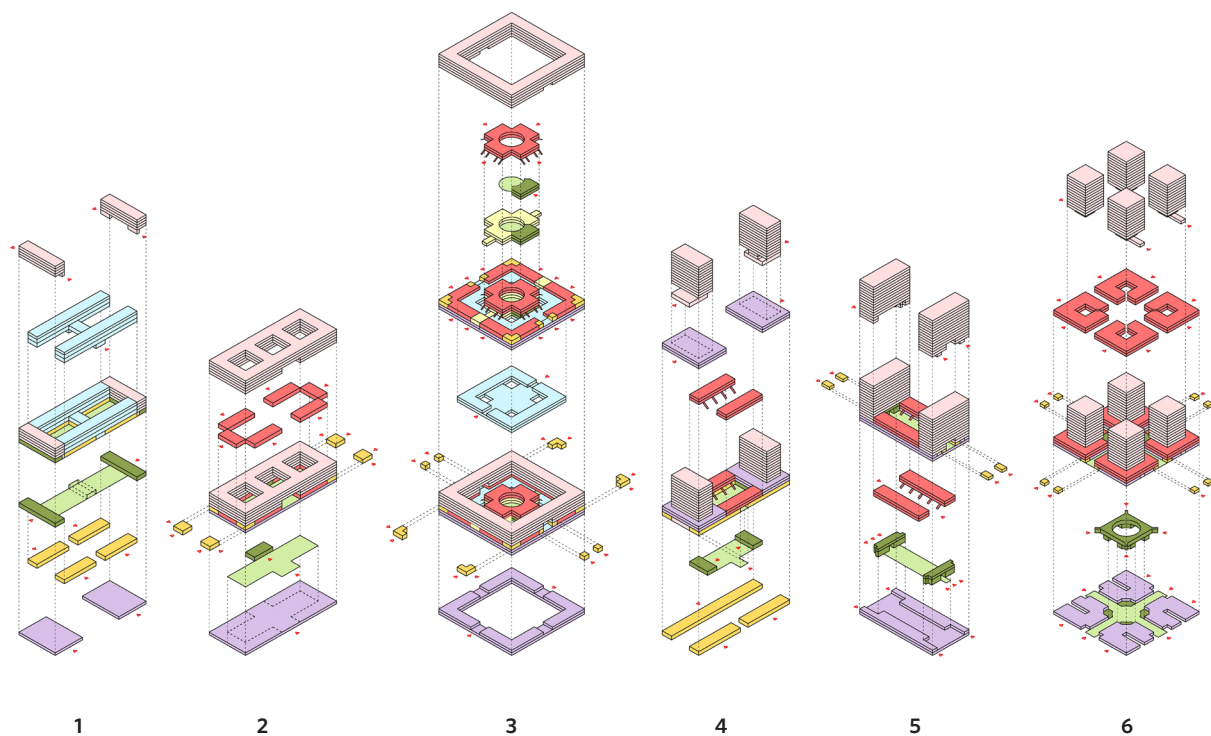
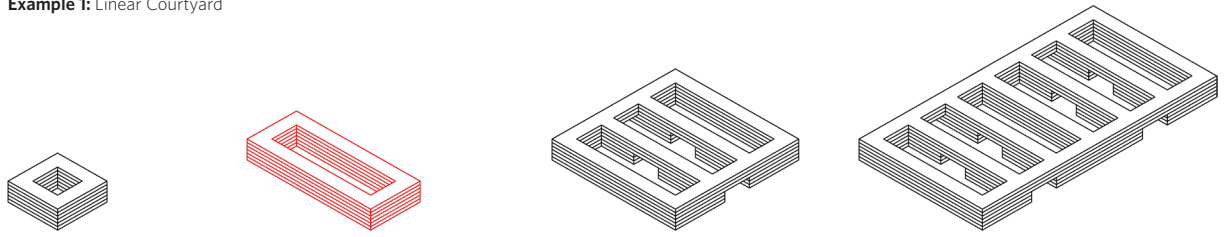
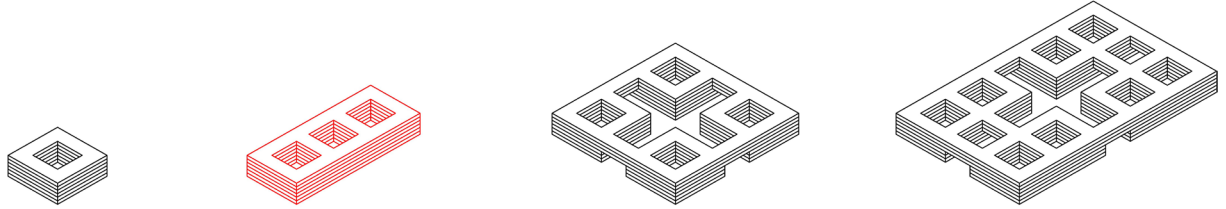


Fig. 3.26
Six examples of building and block design.

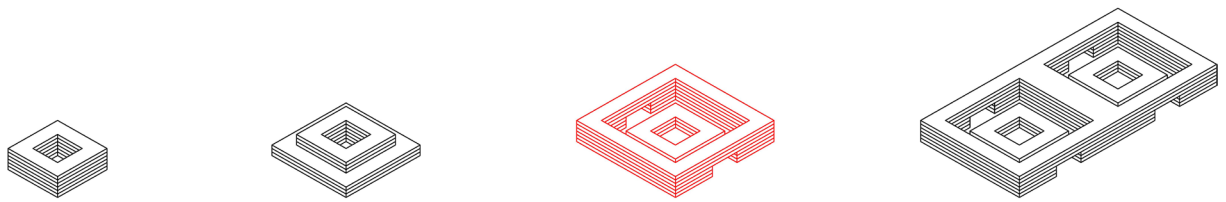
Example 1: Linear Courtyard



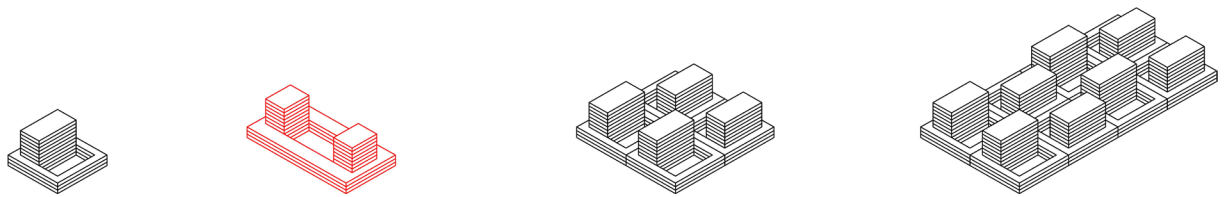
Example 2: Multi-Courtyard Housing Block



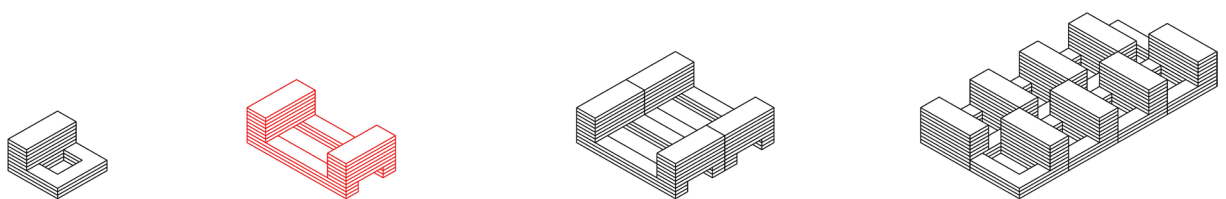
Example 3: Inner Block Circuit



Example 4: High-Rise Courtyard Block



Example 5: Inner Block Street



Example 6: Inner Block Grid

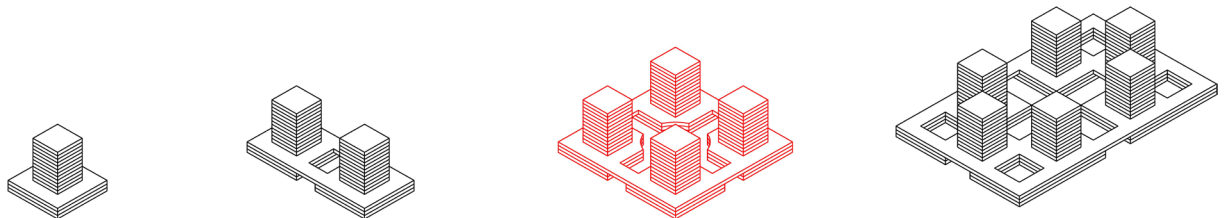


Fig. 3.27
Proliferation potential of the different examples from small to large arrangements that can respond to a wide range of urban patterns.

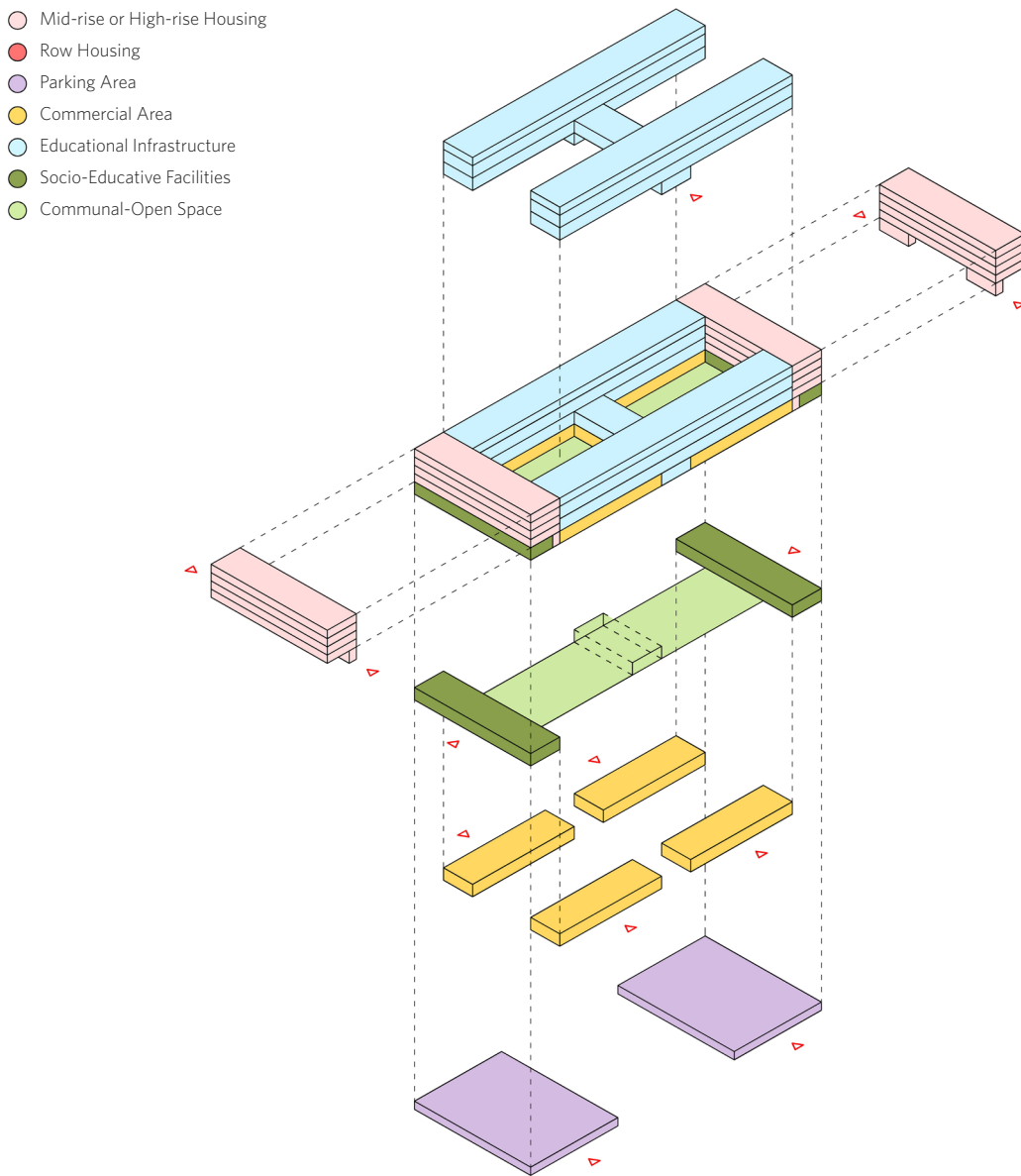


Fig. 3.28
Axonometric drawing of example 1: slab block arrangement (housing, school, and commercial areas).

Example 1: Linear Courtyard (Density: 400 p/ha)

The design is for a 40x100 meters block. Although this solution is below the desired minimum density level (1000 p/ha), it includes a number of important domestic infrastructures, which are a primary school (usually not included in mixed use solutions), commercial areas, communal programmes and parking. The school is designed in such a way that it is contained between two housing slab blocks. The ground floor accommodates commercial areas and most of the school's communal programmes – except the dining hall that is located on the upper floor – which also provides a nursery, library and open spaces (sport facilities). This way, the infrastructures can be used by the school in the morning and the by the community in the afternoon. While this block solution is specifically designed for a primary or secondary school, the main design strategy here is to make the ground a semi-public space. This logic could also be applied to other educational programmes (technical schools or universities), municipal buildings, and sports or cultural facilities.

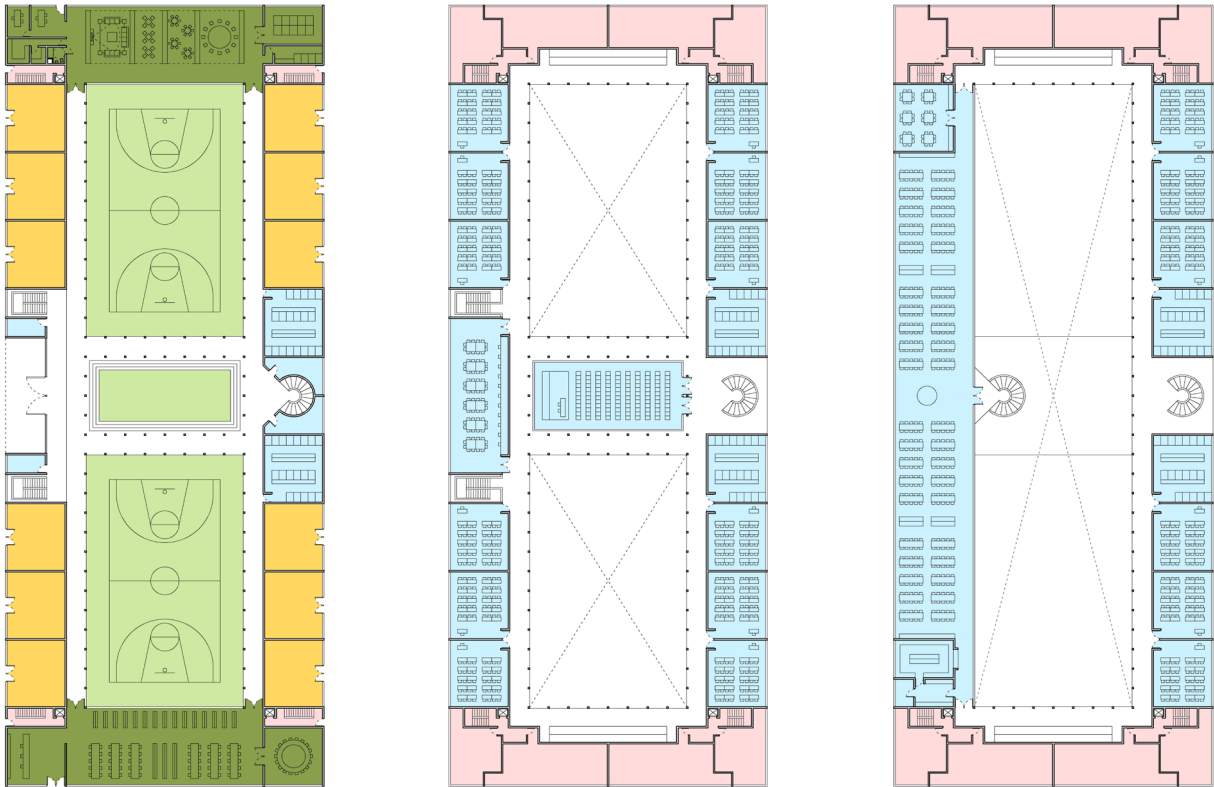
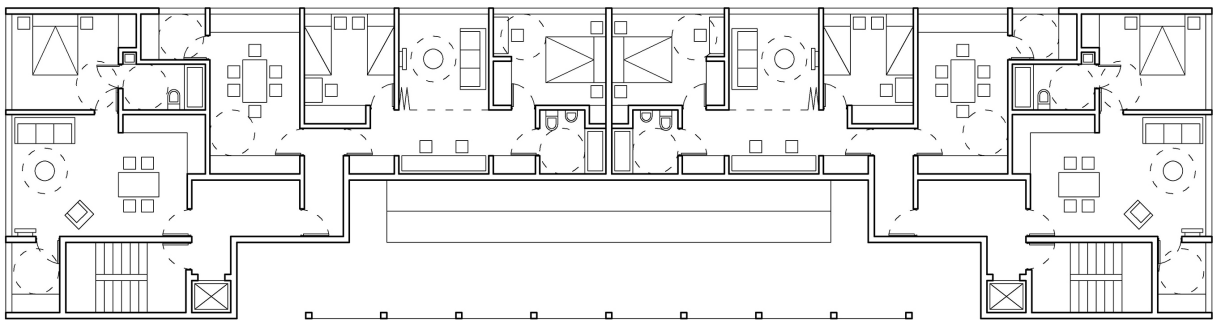


Fig. 3.29
Plans of the ground floor, first floor and fourth floor (from left to right).

Floor plan of housing arrangement in the block's sides (2p and 4p flats) from 1st to 4th level



Floor plan of the nursery in one of the block's sides (accessed from the school and the street) and independent access points to housing

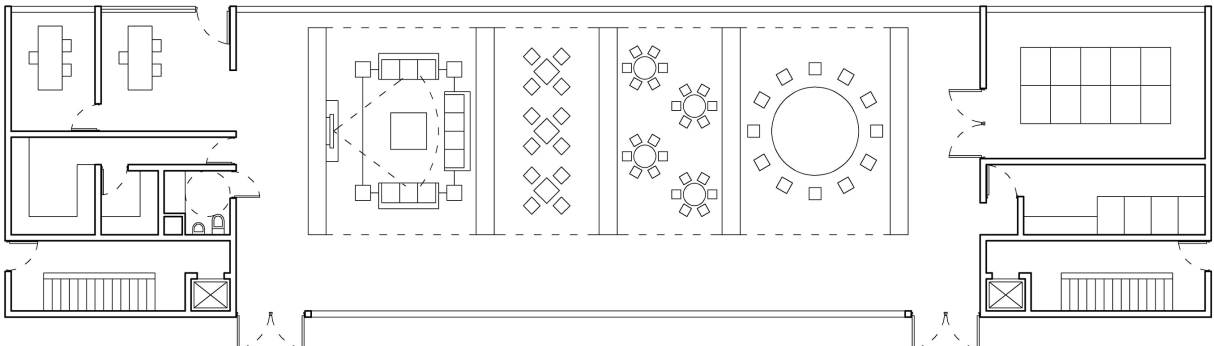


Fig. 3.30
Detail of the arrangement of dwellings and nursery.

- Mid-rise or High-rise Housing
- Row Housing
- Parking Area
- Commercial Area
- Socio-Educative Facilities
- Communal-Open Space

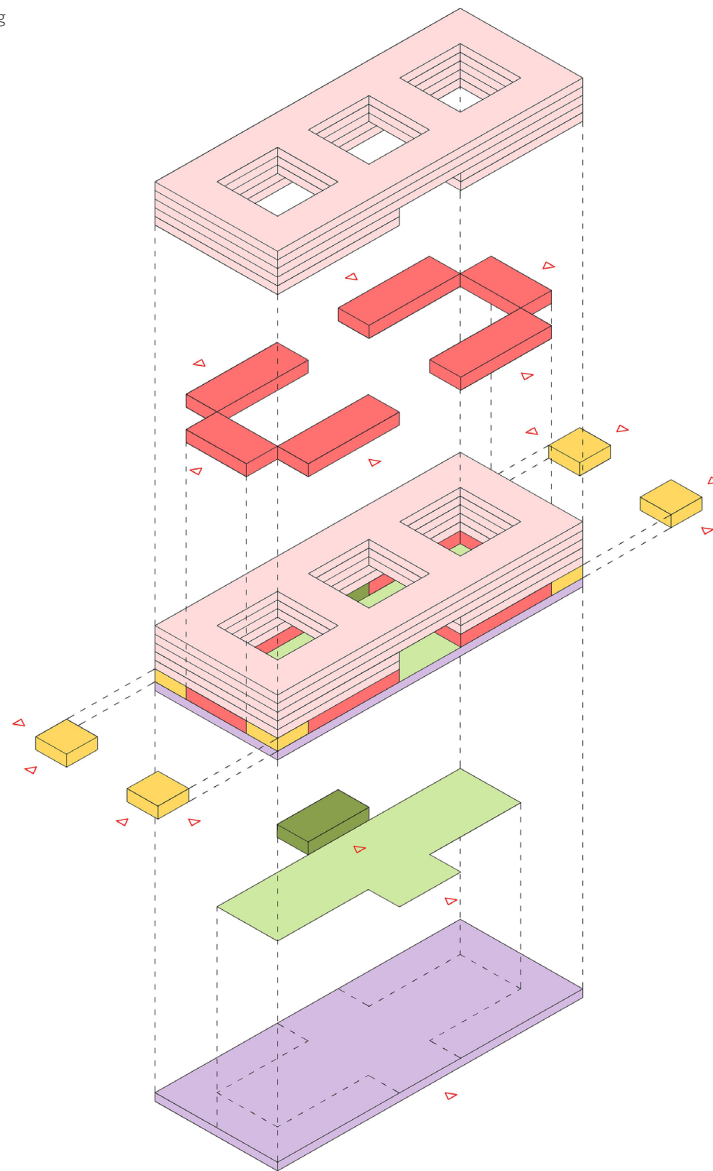


Fig. 3.31

Axonometric drawing of example 2: slab block and row house arrangement (housing and commercial areas).

Example 2: Multi-Courtyard Housing Block (Density: 1500 p/ha)

The design consists of a 40x100 meters block. Its focus is on the relationship between housing slab blocks and internal communal area. Although the design creates three equal-sized courtyards – ensuring the same sun light in all interior spaces – the central one organizes the whole block. The central courtyard functions as an entrance hall and provides socio-educative programmes (nursery, studying spaces, and lounge for old people). Through this strategy, it is possible to create different degrees of privacy, from the street to the entrance hall, and from this to the courtyards with vertical circulation. Considering that this is a mid-rise housing complex, vertical circulation can be staircase-based with lifts only in exceptional cases; this reduces the maintenance cost for social or affordable housing. In addition, the ground floor is raised by half a floor level, which allows for visual privacy for the dwellings that are accessed from the street and reduces the cost of otherwise underground parking.

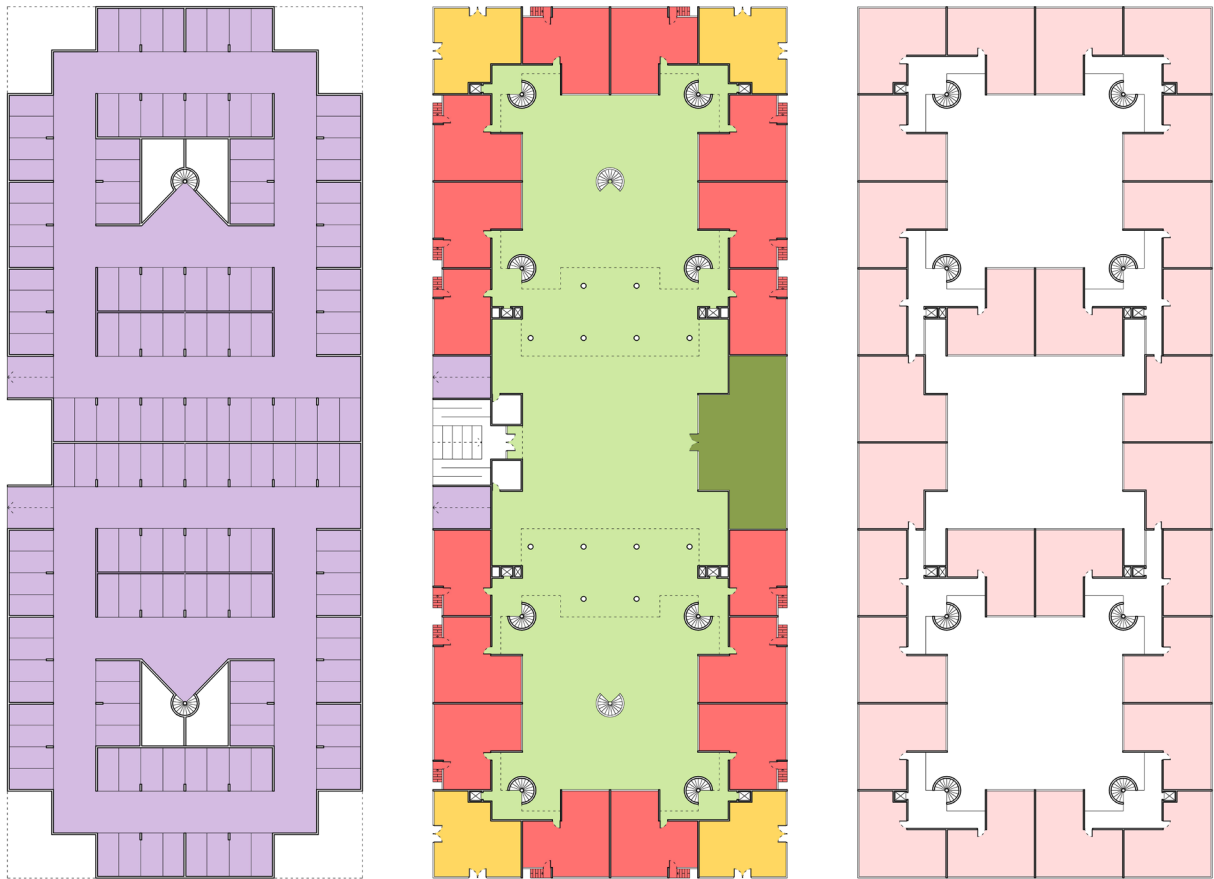


Fig. 3.32
Plans of the basement (parking), ground floor, and third floor (from left to right).

Floor plan of the arrangement of a commercial facility and housing at the ground floor level. The flats are lifted up from the ground 1/2 floor in order to provide visual privacy and security. These housing solutions can be accessed either from the street or the private courtyard.

Floor plan of typical housing arrangement (4p flats from 1st to 4th level). Staircases connect 3 flats per level, minimizing horizontal circulations as much as possible.

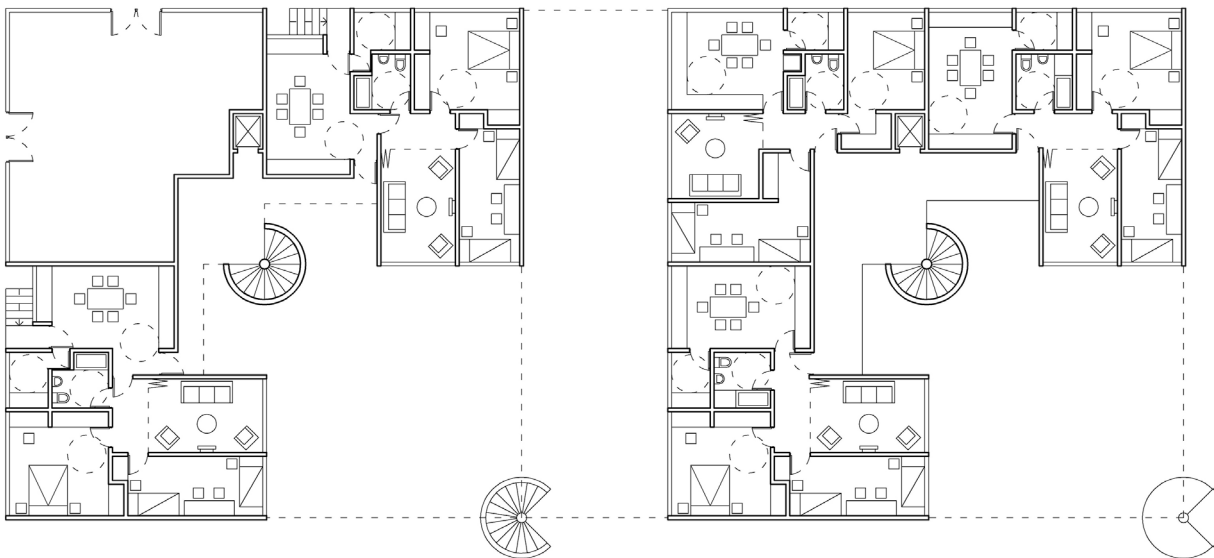


Fig. 3.33
Detail of the arrangement of dwellings in the ground floor (left) and 1st to 4th floor (right).

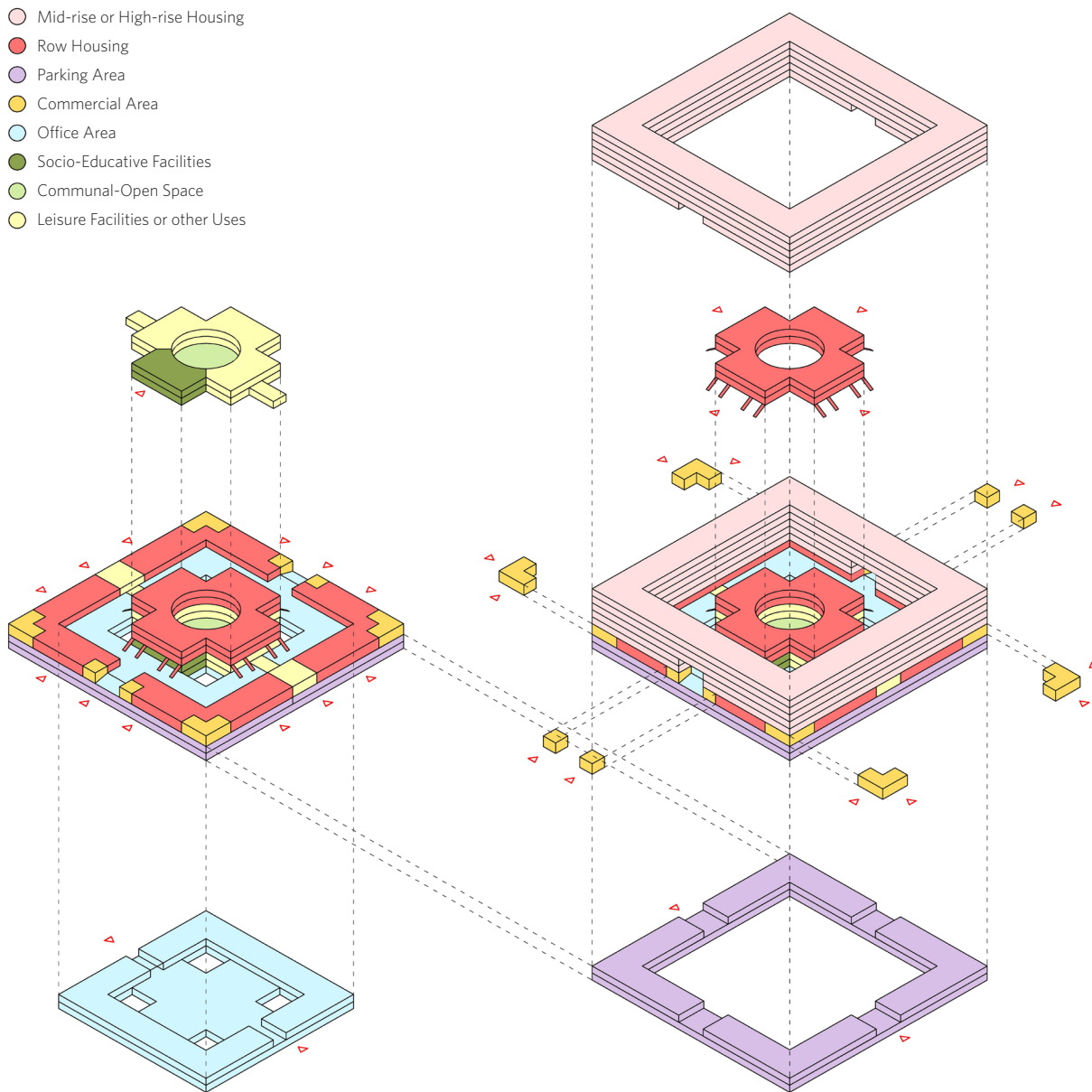


Fig. 3.34
Axonometric drawing of example 3: slab block and row house arrangement (housing, offices, commercial areas, and other uses).

Example 3: Inner Block Circuit (Density: 1300 p/ha)

The design develops in an 80x80 meters block and explores the provision of mixed-uses at the interior of the block. This example brings together housing, commercial areas, communal programmes, offices, and parking. Specifically, the design arranges a housing slab block at the block perimeter, an internal pedestrian circuit (communal open space), row housing in the centre, and a plinth with a system of courtyards that accommodate a socio-educative space and other functions. The infrastructural plinth arranges different programmes both horizontally and vertically. These can be accessed either from the street or the interior of the block, depending on their publicness or privacy. Consequently, the area around the central patio is conceived as a space that can house a range of communal programmes such as a socio-educative spaces, library, and primary health centre, among others.

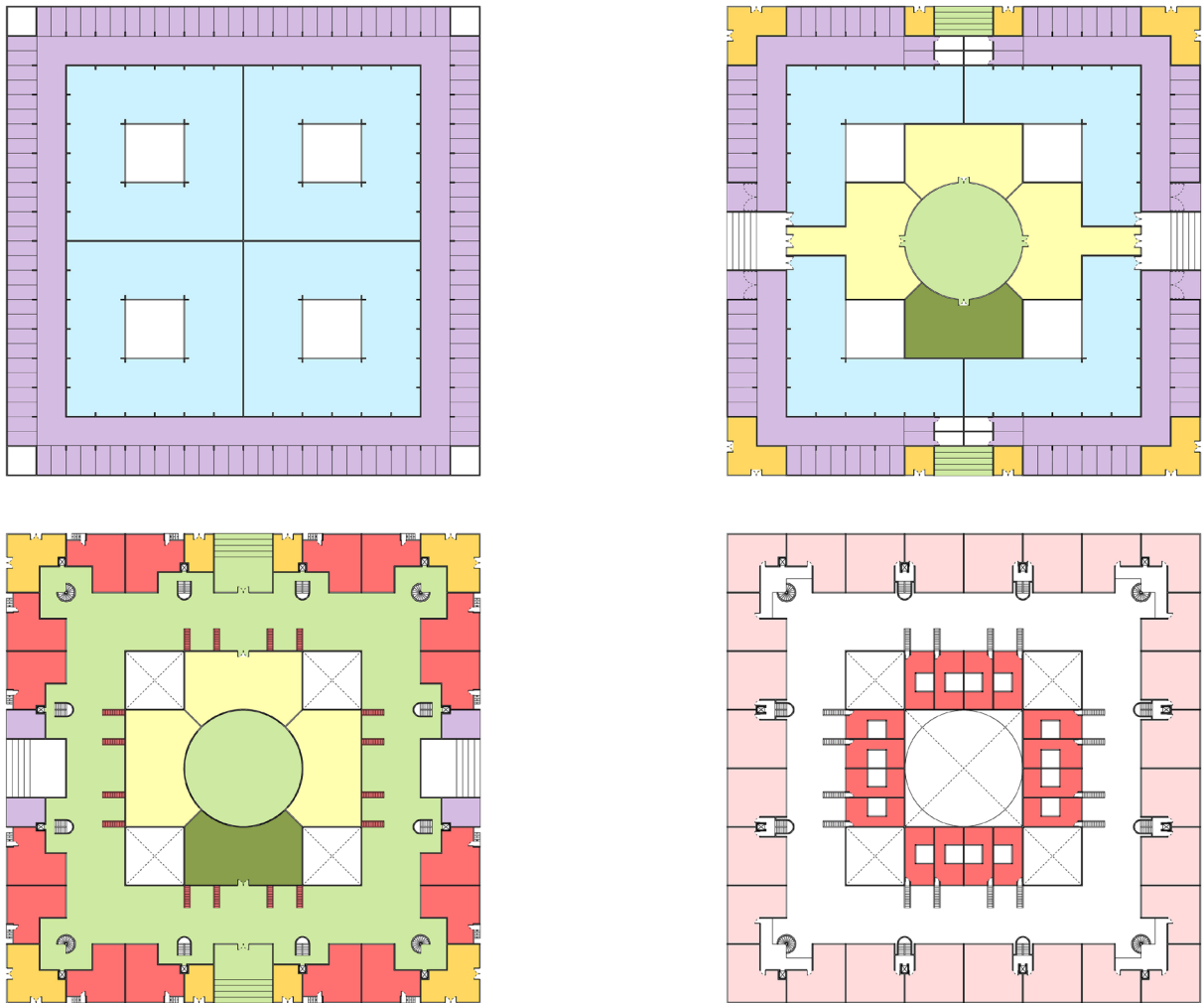


Fig. 3.35
Plans of the second basement (top left), first basement (top right), ground floor (bottom left), and second floor (bottom right).

Floor plan of typical housing arrangement (4p and 6p flats rom 1st to 4th level) at the block's perimeter. Corner solutions (the same of the Example 2) can be combined with linear arrangements in order to respond to different block forms. The centre of the block is occupied with 2-storey row houses (4p dwellings) accessed from the ground floor but develop at the 1st and 2nd level, which gives space to accommodate communal facilities at the pedestrian level.

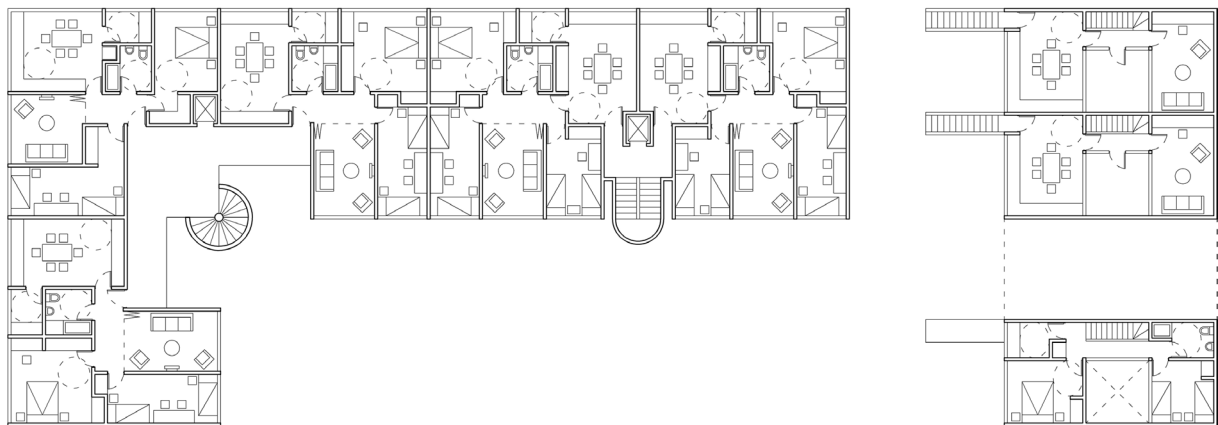


Fig. 3.36
Detail of the arrangement of dwellings for the slab block (left) and 2-storey row houses (right).

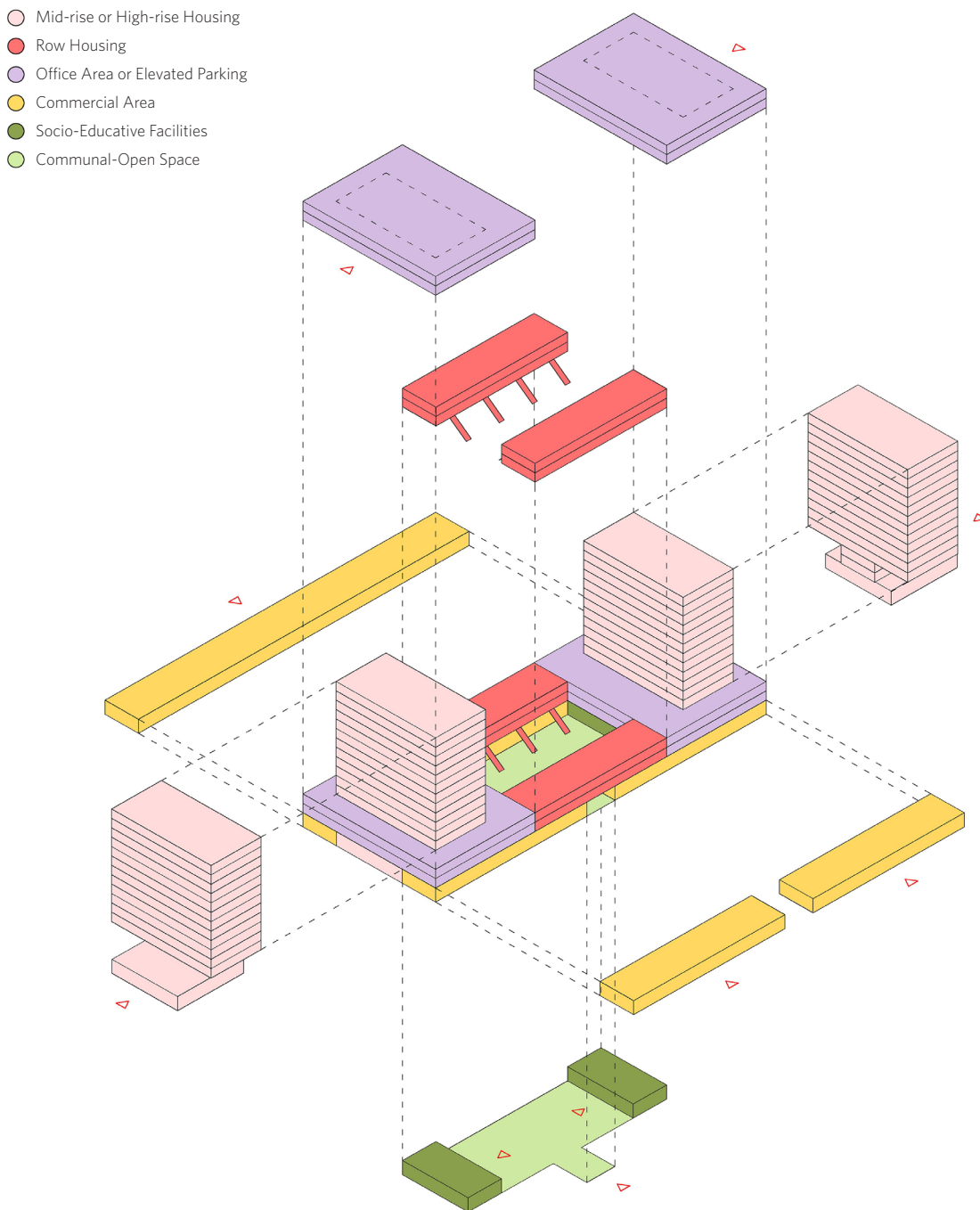


Fig. 3.37
Axonometric drawing of example 4: mixed use block row house and tower arrangement (housing, offices, and commercial areas).

Example 4: High-Rise Courtyard Block (Density: 1600 p/ha)

The design is for a 40x100 meters block and is based on a combination of tower blocks and row houses. These are organized by an infrastructural plinth that brings together commercial areas, office spaces or parking, and socio-educative facilities. Despite the different buildings being independent from each other and accessed from the street – eventually accommodating different forms of housing – they share a communal open space that is controlled by the socio-educative facilities. Thus, it becomes a space for social encounter.

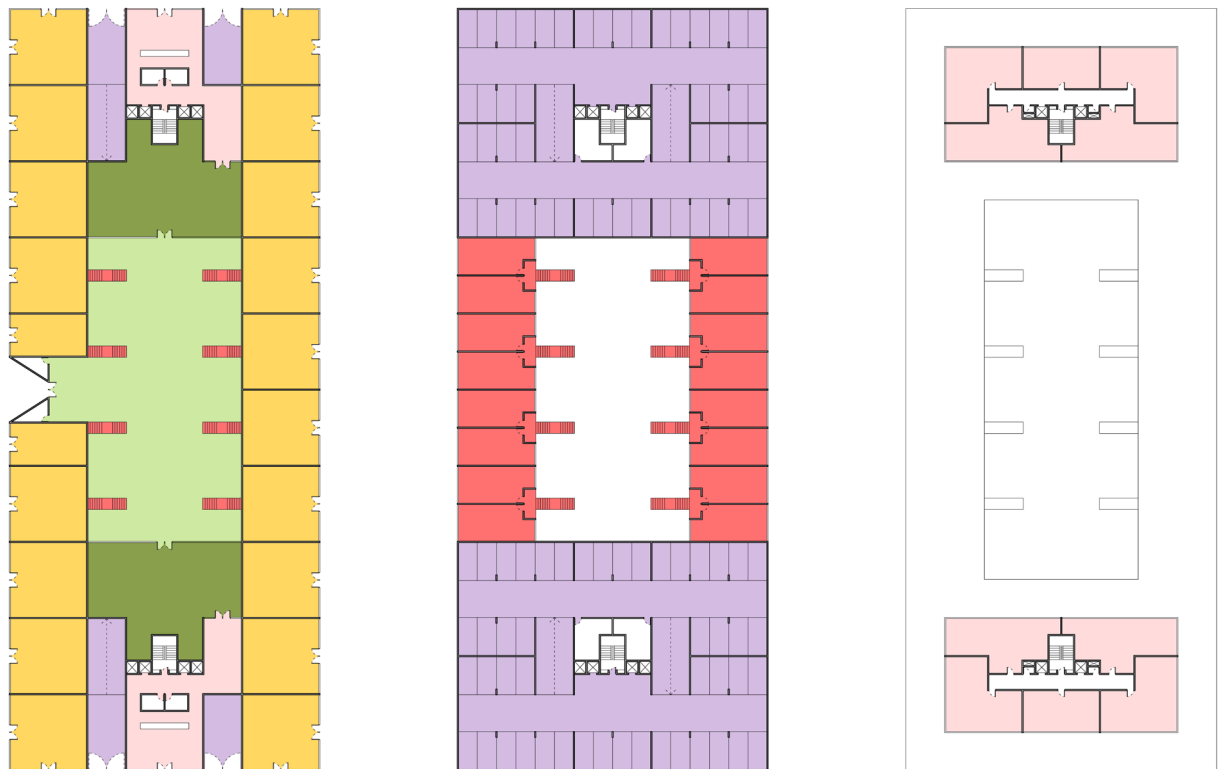


Fig. 3.38
Plans of the ground floor, first floor and fifth floor (from left to right).

Floor plan of typical housing tower arrangement (2p and 4p flats from 3rd to 12th level) and row housing arrangement (6p flats). The tower is provided with 1 vertical circulation that works for 5 flats per level and is strategically located at the centre of the layout in order to minimize horizontal circulations. The design criteria for the row houses is similar to the one of Example 3 but instead of communal facilities they accommodate a commercial area beneath.

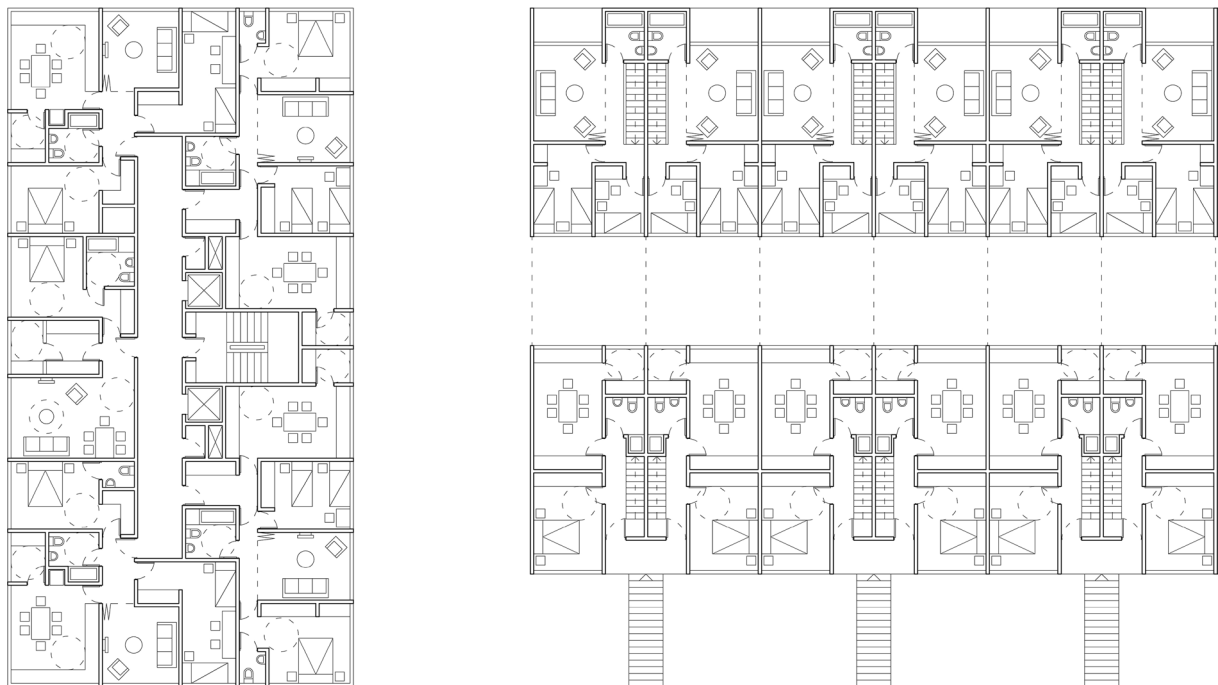


Fig. 3.39
Detail of the arrangement of dwellings for the towers (left) and 2-storey row houses (right).

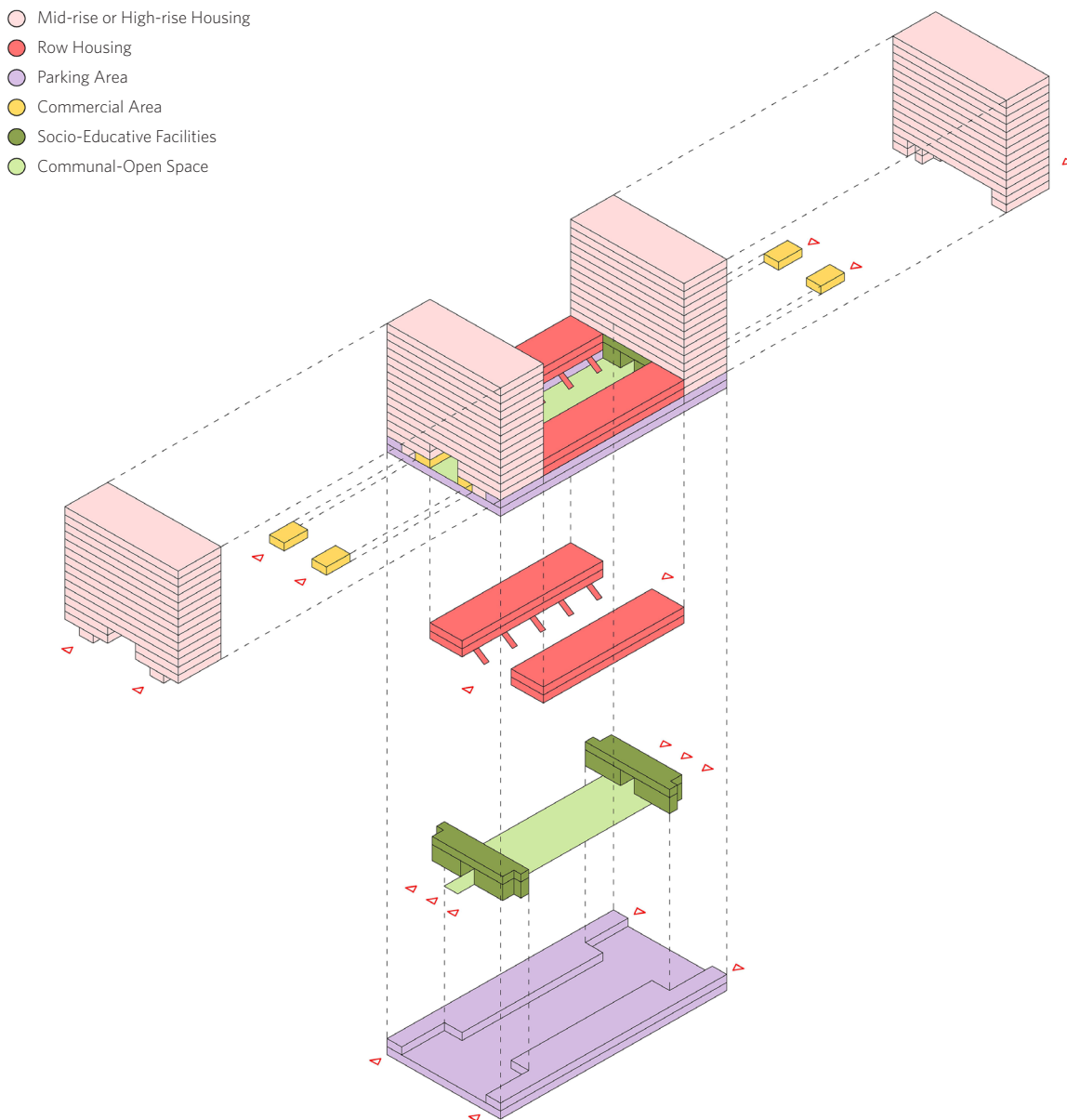


Fig. 3.40
Axonometric drawing of example 5: row-house and high-rise slab block arrangement (housing and commercial areas).

Example 5: Inner Block Street (Density: 1400 p/ha)

The design is for a block fragment of 40x80 meters, which through repetition can produce a block configuration of flexible length. This creates an internal corridor that crosses the entire block and combines high-rises and row housing. The socio-educative spaces are disposed in such a way that they form a threshold between exterior and interior (street and corridor), which allows inclusion of other communal programmes that could be shared with the rest of the urban block and neighbourhood – such as a library or primary health centre. The proposed corridor is a communal area that provides both access to the row houses – arranged over the parking level at the ground – and green open spaces. Like previous examples, each building is independent from others and has its individual access. However, the tight arrangement of the different buildings around the corridor transforms this space into a place for coexistence and social interaction.

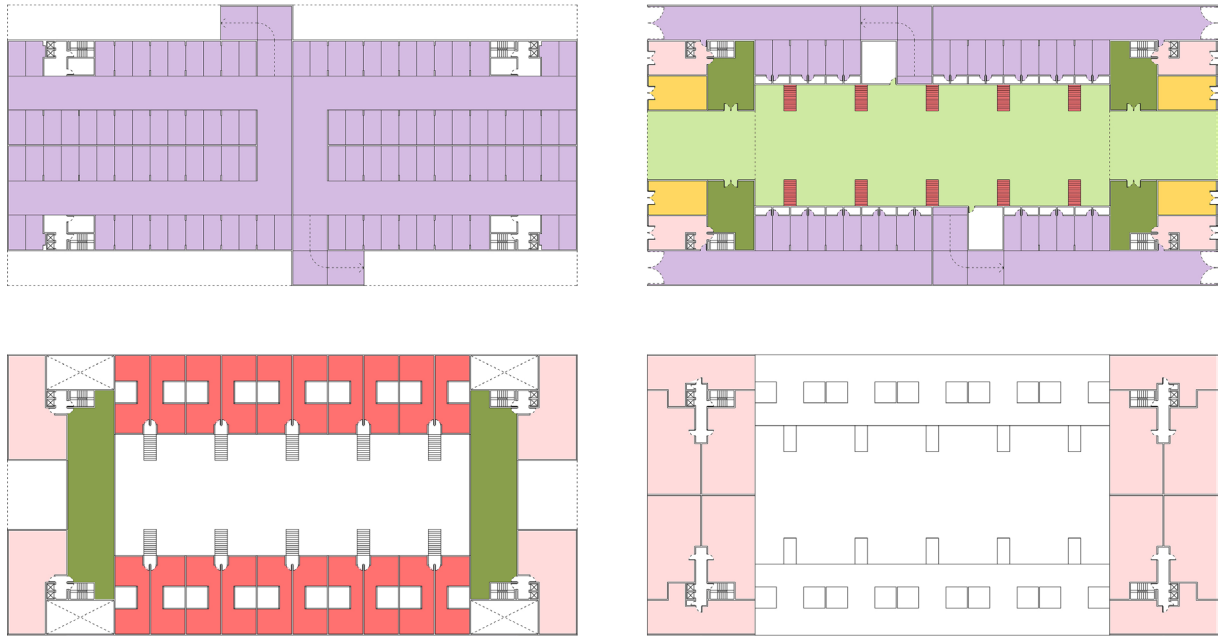
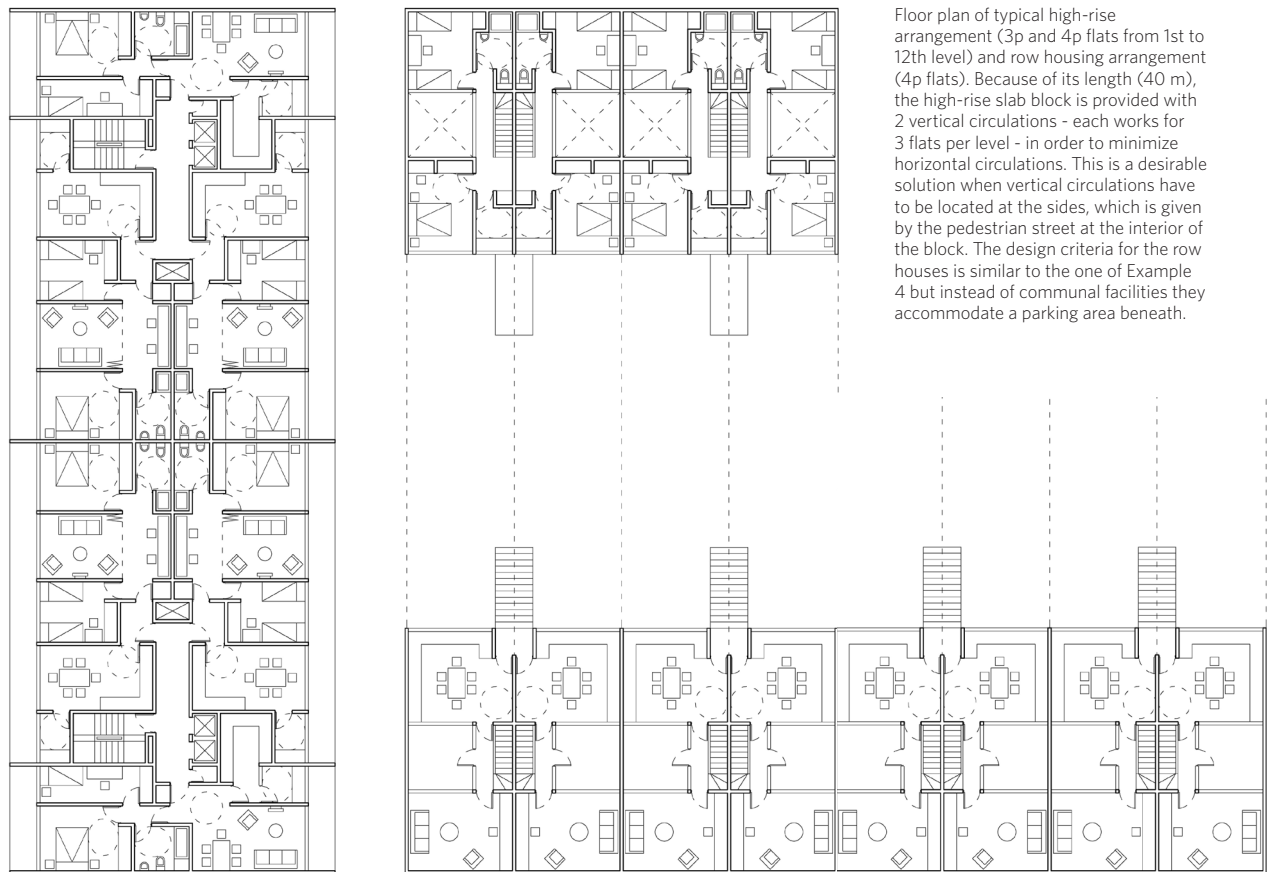


Fig. 3.41
Plans of the basement (top left), ground floor (top right), second floor (bottom left), and fifth floor (bottom right).



Floor plan of typical high-rise arrangement (3p and 4p flats from 1st to 12th level) and row housing arrangement (4p flats). Because of its length (40 m), the high-rise slab block is provided with 2 vertical circulations - each works for 3 flats per level - in order to minimize horizontal circulations. This is a desirable solution when vertical circulations have to be located at the sides, which is given by the pedestrian street at the interior of the block. The design criteria for the row houses is similar to the one of Example 4 but instead of communal facilities they accommodate a parking area beneath.

Fig. 3.42
Detail of the arrangement of dwellings for the high-rise slab block (left) and 2-storey row houses (right).

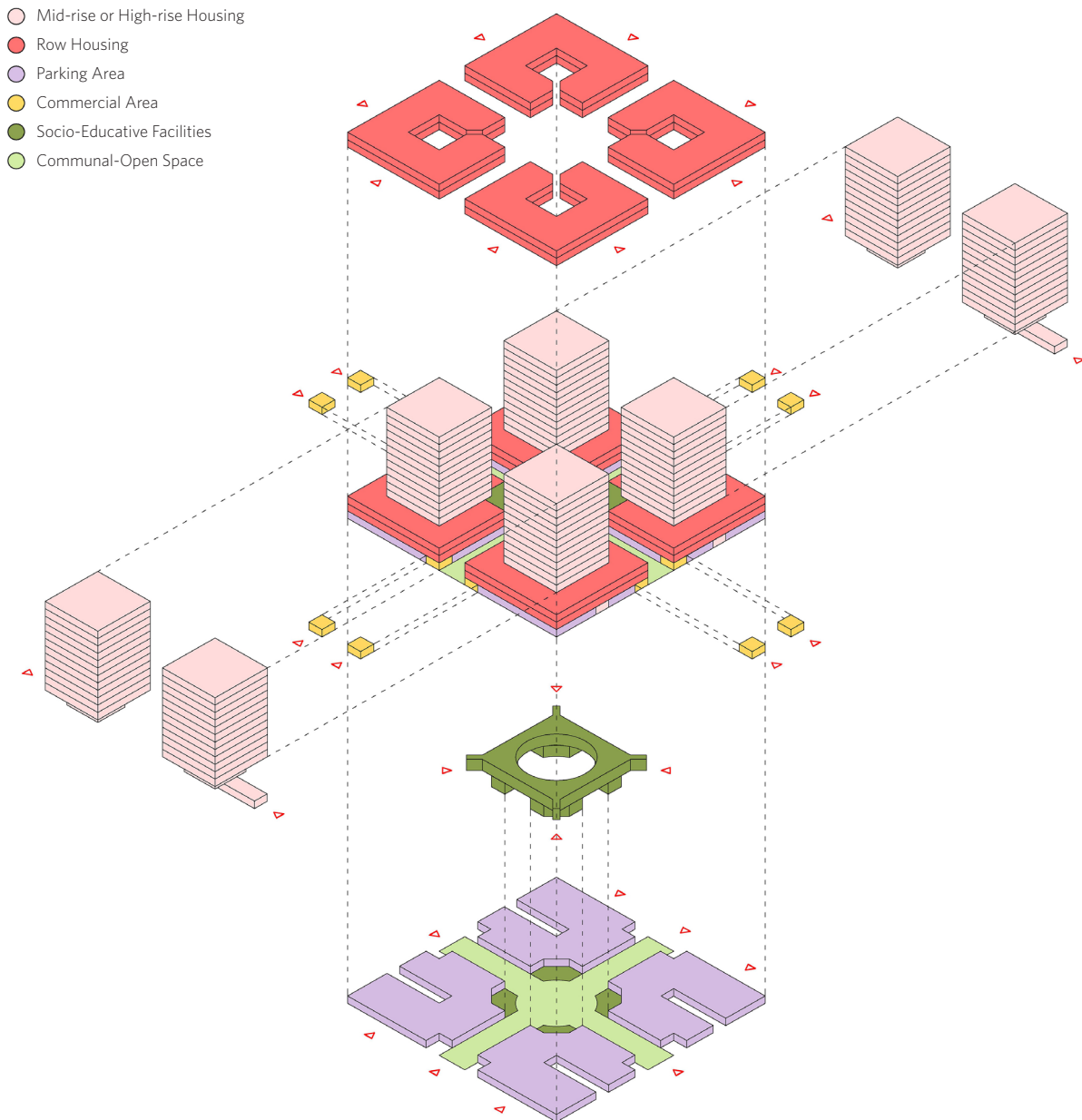


Fig. 3.43
Axonometric drawing of example 6: row-house and tower arrangement (housing and commercial areas).

Example 6: Inner Block Grid (Density: 1800 p/ha)

The design develops in an 80x80 meters block. It is a system of internal streets defined by a typological hybrid of tower block with row houses along its perimeter. Based on this elementary housing arrangement, the general design scheme creates two kinds of interior: one made up of corridors – faced by row houses – and another with a central space that connects the socio-educative facilities of the different buildings. The design can be conceived either as two crossing corridors with a courtyard at their intersection, or as four streets connected by a private cluster. Whichever the case, the circulation provides direct access to the row houses. These are lifted up from the ground – hiding parking areas below belonging to the tower blocks – and are connected by individual staircases, which provide visual privacy.

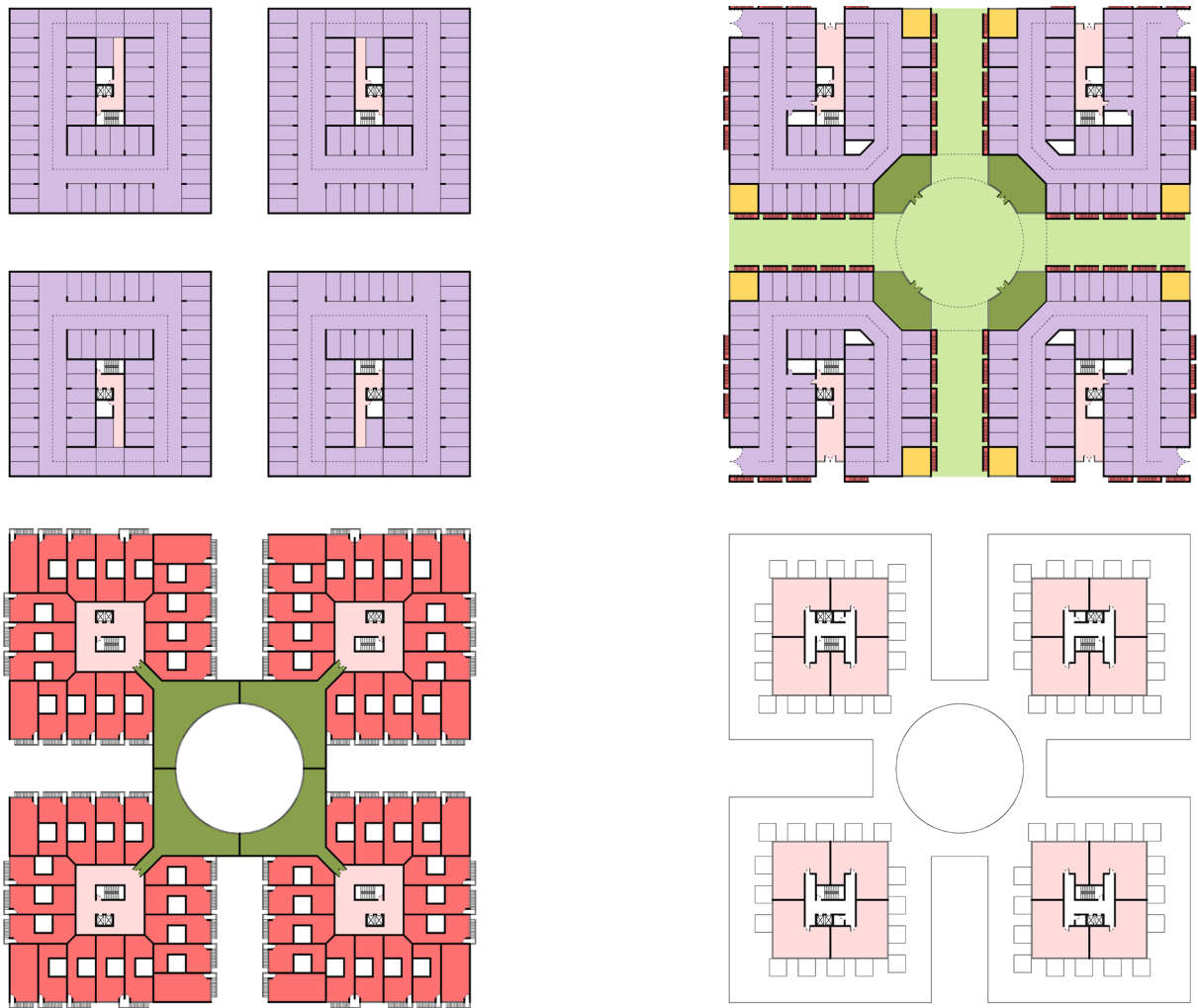


Fig. 3.44
Plans of the basement (top left), ground floor (top right), second floor (bottom left), and fifth floor (bottom right).

Floor plan of typical housing tower arrangement (4p flats from 3rd to 12th level) and row housing arrangement (4p flats). The tower is provided with 1 vertical circulation that works for 4 flats per level. The design criteria for the row houses is similar to the one of Example 5, accommodating a parking area beneath.

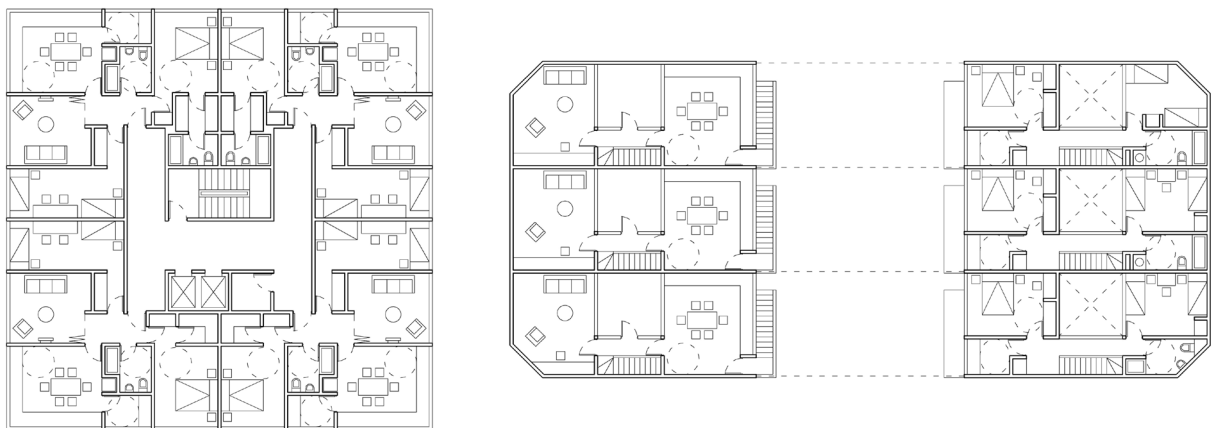


Fig. 3.45
Detail of the arrangement of dwellings for the tower block (left) and 2-storey row houses (right).

DWELLING

4

4.1 DESIGN PROBLEM

When defining a minimum dwelling, this must be adequately equipped and designed in order to answer basic needs and therefore respond to physiological, productive, and socio-reproductive requirements that conform daily life. However, answering basic needs does not mean providing an extensive list of functions to fulfil nor a simplified dwelling programme that fails to answer household needs. On the contrary, it must rethink the way living patterns are framed in order to provide a minimal physical space that can produce a maximum of possibilities for dwelling.

Living Patterns

The most common mistake in minimum dwelling design is the attempt to imitate the programme of an aspirational mid-income house, which consists of bedrooms, bathrooms, living room, dining room, family room, dining kitchen, and laundry area. This 'ideal' programme is subject to affordability, which leads to eliminating some of its functions. In this process, **what is usually discarded from the dwelling programme is the dining kitchen, family room, and private bathrooms, maintaining the formal function of the living and dining room. However, the dining kitchen and family room concentrate most domestic activities and represent the centre of daily life.** The former is the most demanded space whereas the latter responds to multiple purposes such as studying, watching TV, playing, working, and extra room.

Minimum Dwelling Programme

Instead of reproducing a conventional dwelling programme, **the minimum dwelling should remove redundant spaces, which are the living room, dining room, and the excessive number of bathrooms and bedrooms**, in order to reduce the dwelling area and provide housing of an overall higher standard suitable to today's household composition and needs. In doing so, the dwelling programme should be the following:

- Dining kitchen
- Family room
- Generic bedrooms
- 1 Bathroom
- Laundry room

The most common mistake in minimum dwelling design is the attempt to imitate the conventional functions of an aspirational mid-income house.

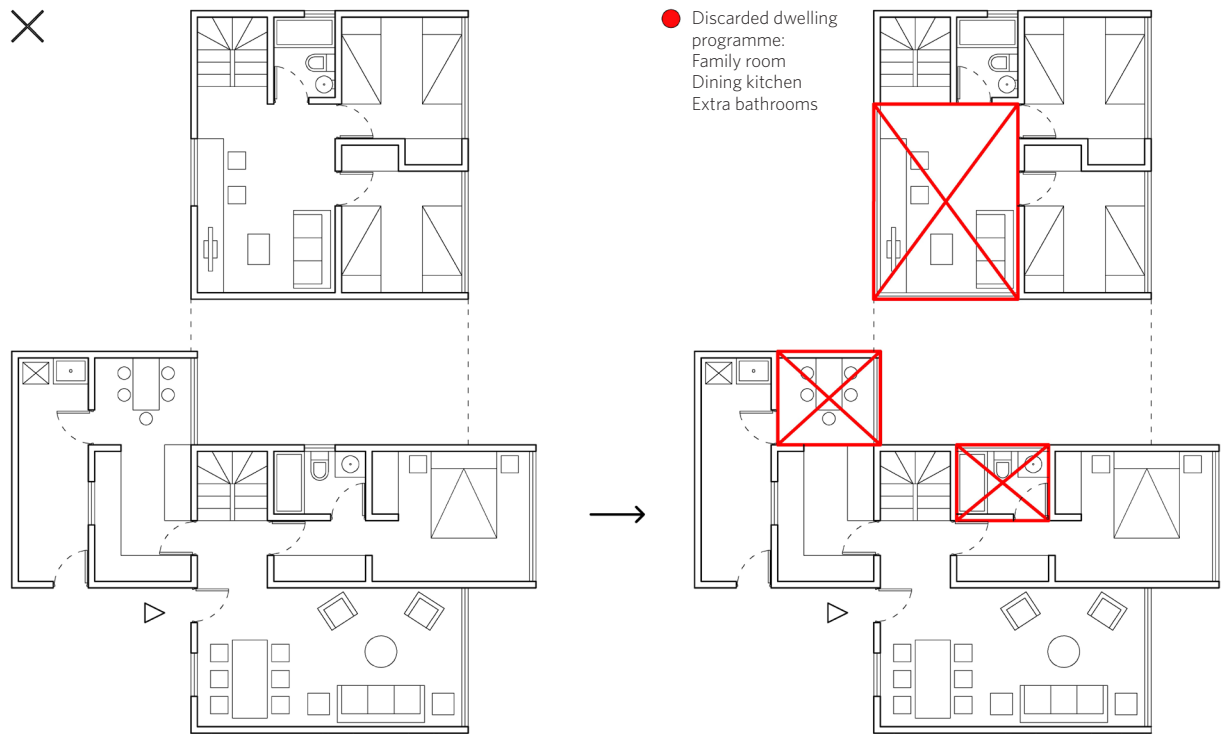


Fig. 4.1
Example of an aspirational mid-income dwelling programme and its conventional reinterpretation for low-income housing.

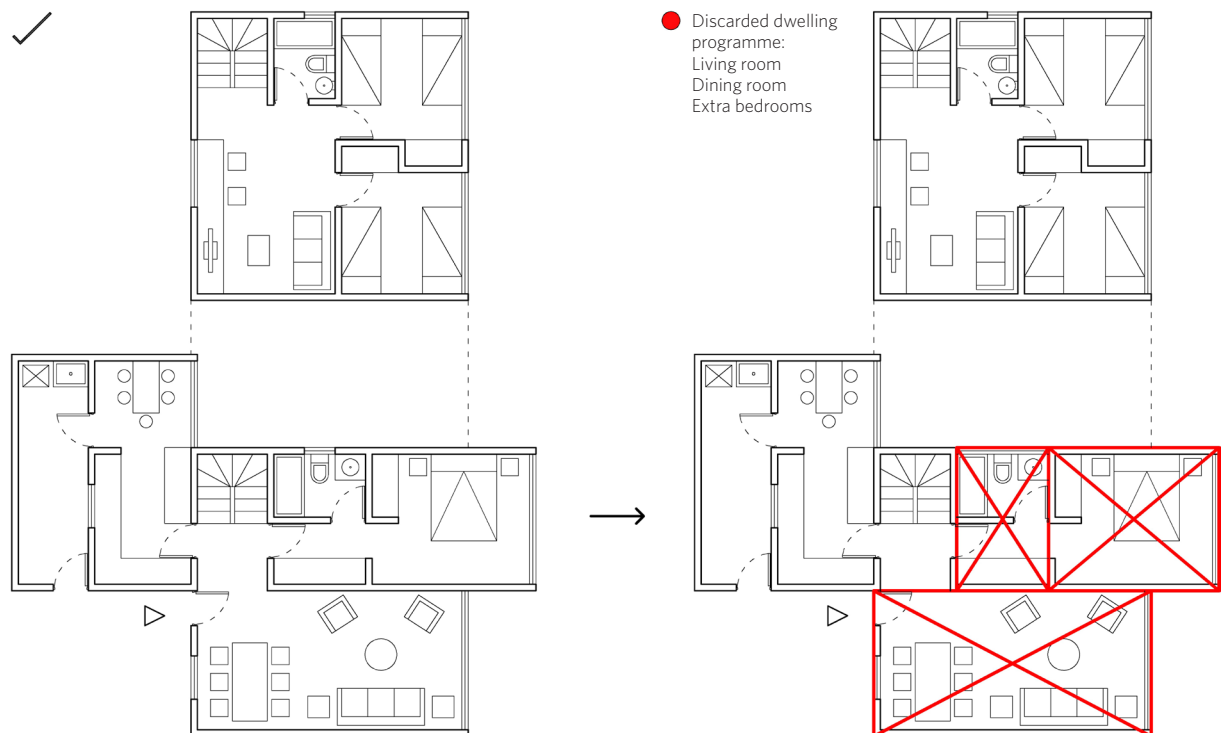


Fig. 4.2
Example of an aspirational mid-income dwelling programme and its proposed reinterpretation according to current living patterns.

4.2 HOUSEHOLD STRUCTURE AND FLEXIBILITY

The household structure is a very important issue to consider in the dwelling design, particularly, for low-income groups, who have seen a reduction in the family size over recent years. **Although a low-income family has an average of 3.3 members per family, it is typically provided with at least 3 to 4 bedrooms that can accommodate 6 to 8 people, which is redundant and not the best use of resources.** Instead of insisting on this outdated idea of the family, housing supply should produce a range of dwelling sizes. These should be able to respond to the following criteria:

- Meet new multi-generational demands, from young couples to the elderly, allowing for change of dwelling usage according to fluctuating needs throughout the lifetime of a home and its inhabitants
- In the case that the household structure slightly changes and requires more bedrooms, this can be solved by transforming the family room into an extra bedroom
- The family room has to be strategically placed in the plan in order to provide privacy when required
- The disposition of the family room should allow for creating a conventional dwelling arrangement by producing one large space that accommodates the living room, dining table, and kitchen
- The transformation of a dwelling arrangement should be achieved by modifying the fewest number of wall partitions
- The bathroom and laundry area should be concentrated in a strategic zone in order to allow for future transformations to the dwelling arrangement

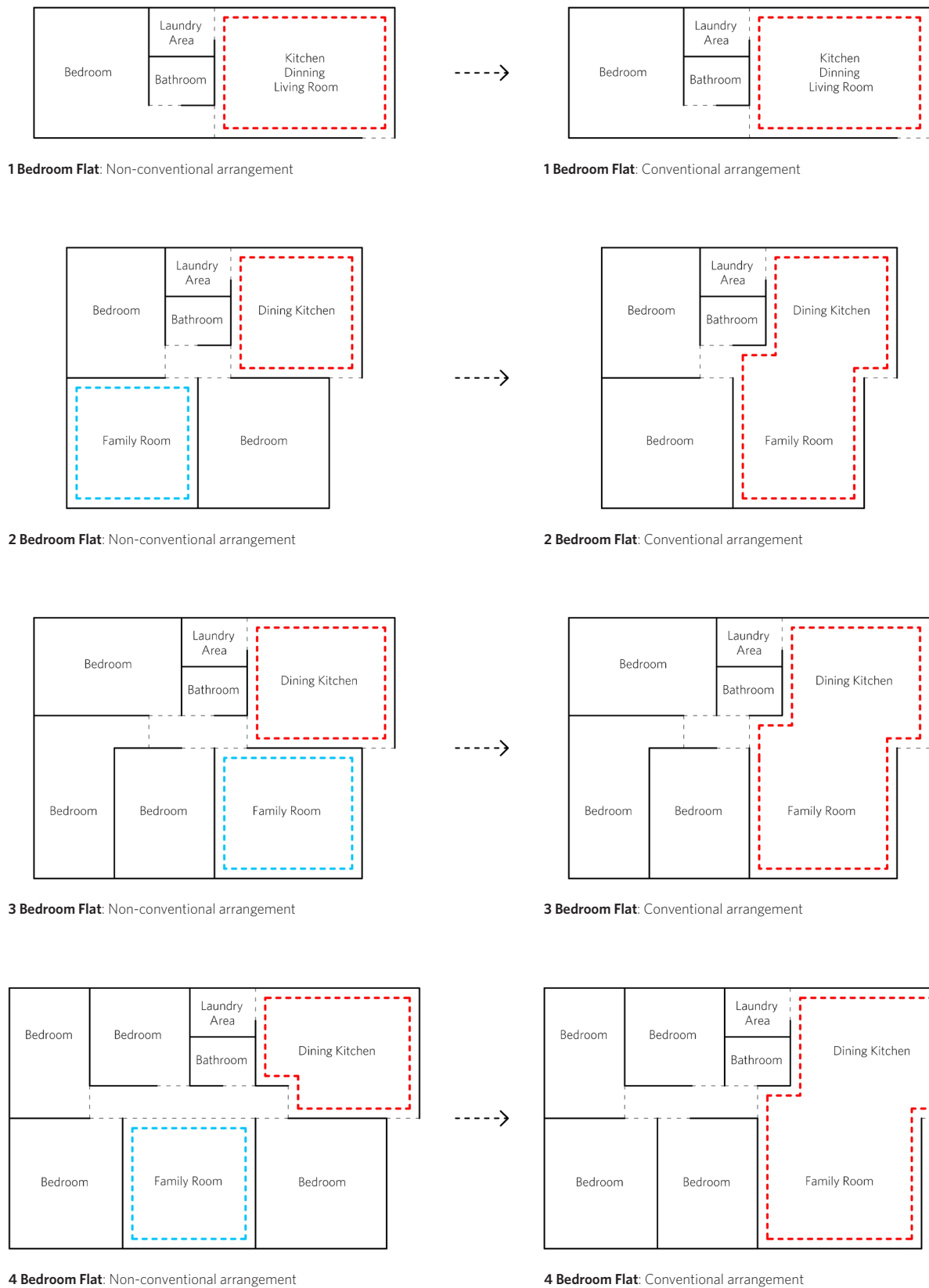


Fig. 4.3
Possible design criteria for flexible dwelling arrangements (non-conventional and conventional layouts).

4.3 SPACE STANDARDS

The aim of space standards is to ensure minimum dimensions for spaces used for prescribed functions and activities. Assuming that essential furniture and ergonomics are the same for everyone, space standards are to a great extent generic. The main variable is the dwelling programme – depending on the number of people and building storeys – which when applied produces a specific dwelling size. This means that the overall size of a minimum dwelling comes from previously defined design constraints and not vice versa.

This approach towards dwelling design is different to those applied in recent years to low-income housing. Here, the **space standards and dwelling programme have been subject to a process of shrinkage based on a previously defined dwelling size (between 38 and 55 m²), which creates a sub-standard housing solution. On the other hand, space standards do not exist for private housing.** The problem with this is that the real estate market is providing dwellings that in most cases do not even meet the already criticized low-income housing space standards. Hence, in order to provide adequate dwelling solutions, **quality space standards must be applied in all forms of housing.** Space standards should consider the following areas:

- Laundry Area
- Kitchen Area
- Dining Area
- Circulation Zones
- Family Room
- Bedrooms
- Corridors and Staircases

5-PERSONS LOW-INCOME DWELLING PROGRAMME

Master bedroom: Yes
 Children's bedroom: No
 (2 expected with growth)
 Dining room: Yes
 Living Room: No (expected with growth)
 Kitchen: Yes
 Dining area in kitchen: No
 Bathrooms: 1
 Laundry Area: No (expected with growth)

×

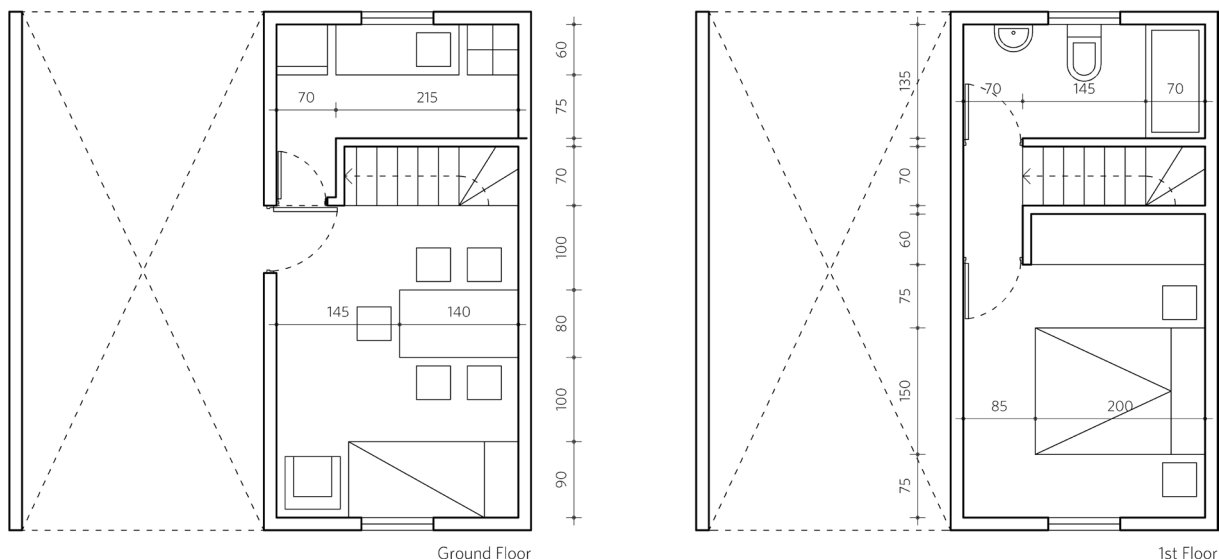
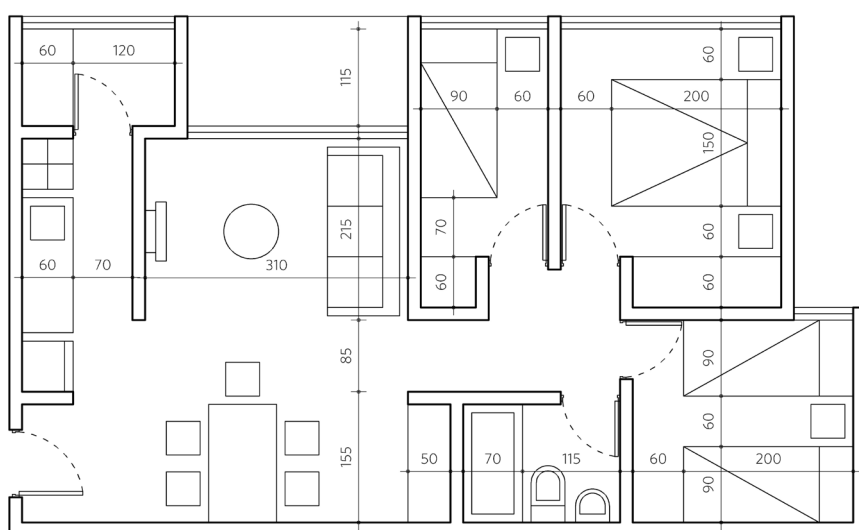


Fig. 4.4
 Example of low-income housing sub-standards (project by Elemental Architects).

×

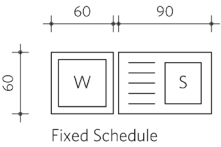


5-PERSONS MID-INCOME DWELLING PROGRAMME

Master bedroom: Yes
 Children's bedroom: 2
 Dining room: Yes
 Living Room: Yes
 Kitchen: Yes
 Dining area in kitchen: No
 Bathrooms: 1
 Laundry Area: Yes

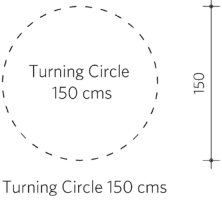
Fig. 4.5
 Example of mid-income housing sub-standards (typical dwelling solution by the real estate market).

LAUNDRY AREA

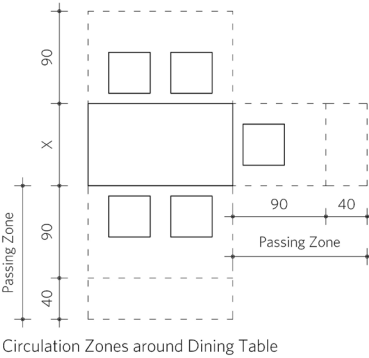
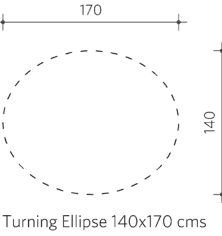
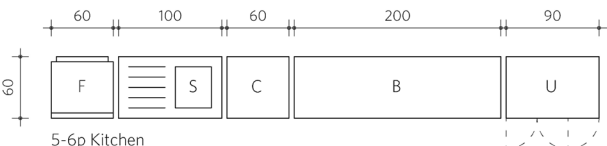
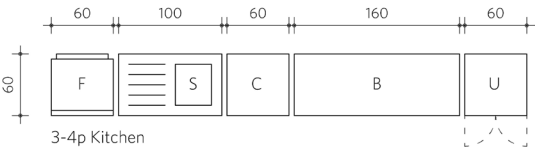
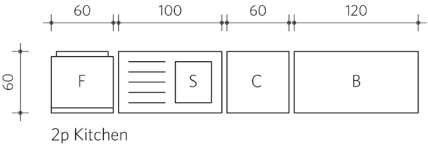
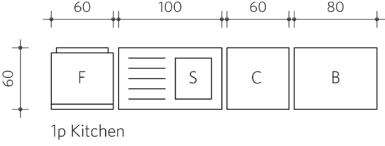


- Key to Items
- F Fridge and Freezer
 - S Sink
 - C Cooker
 - B Base Unit
 - W Washer-Dryer Machine
 - U Storage Unit

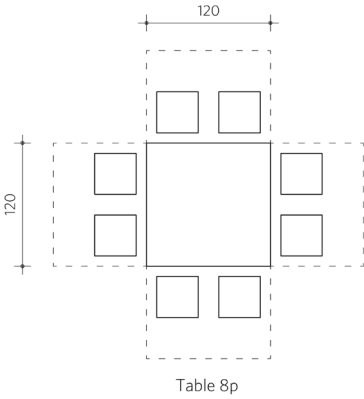
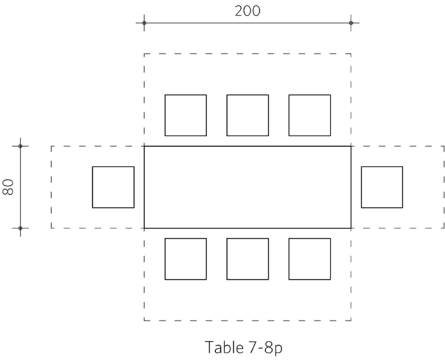
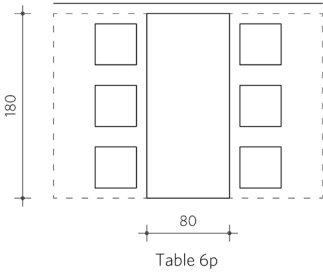
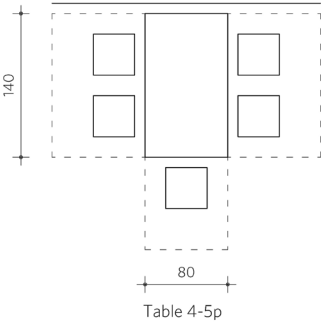
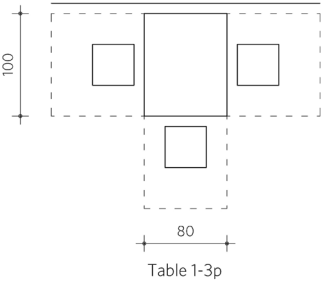
CIRCULATION ZONES



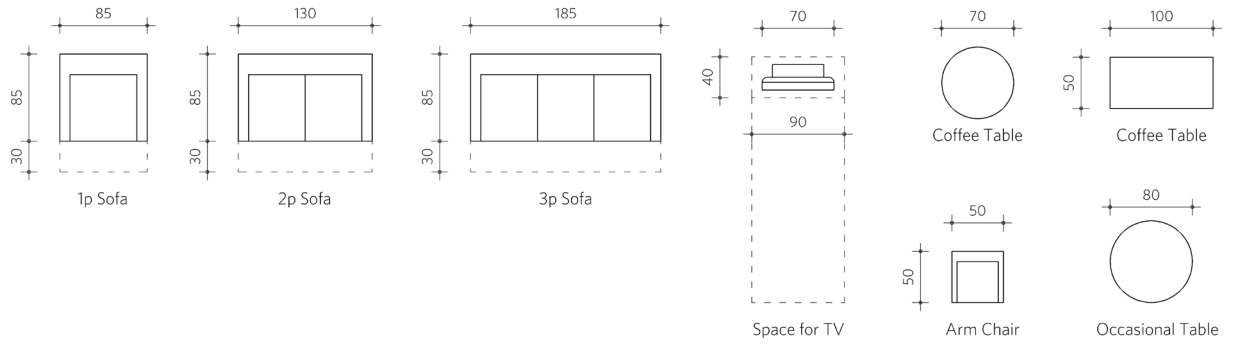
KITCHEN AREA



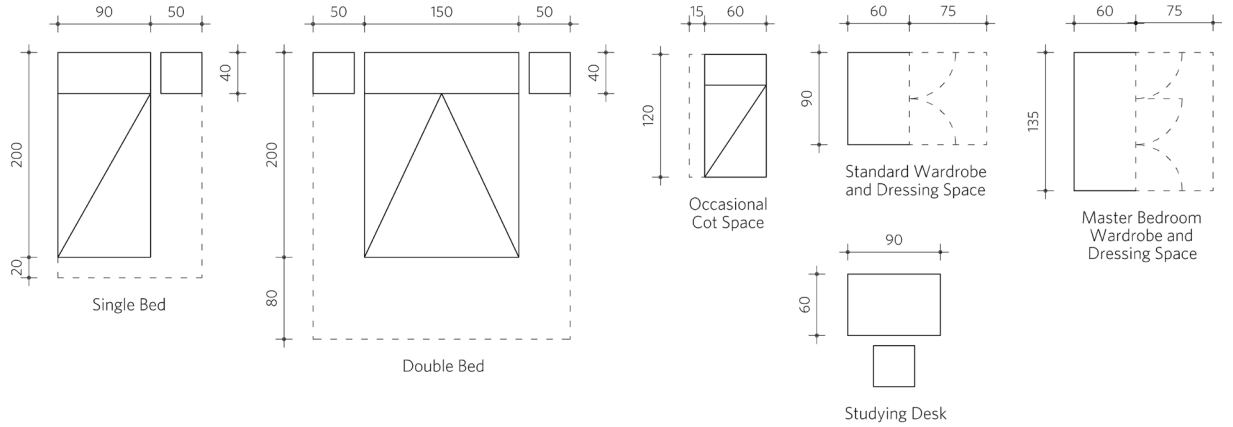
DINING AREA



FAMILY ROOM / LIVING ROOM



BEDROOMS



CORRIDORS AND STAIRCASES

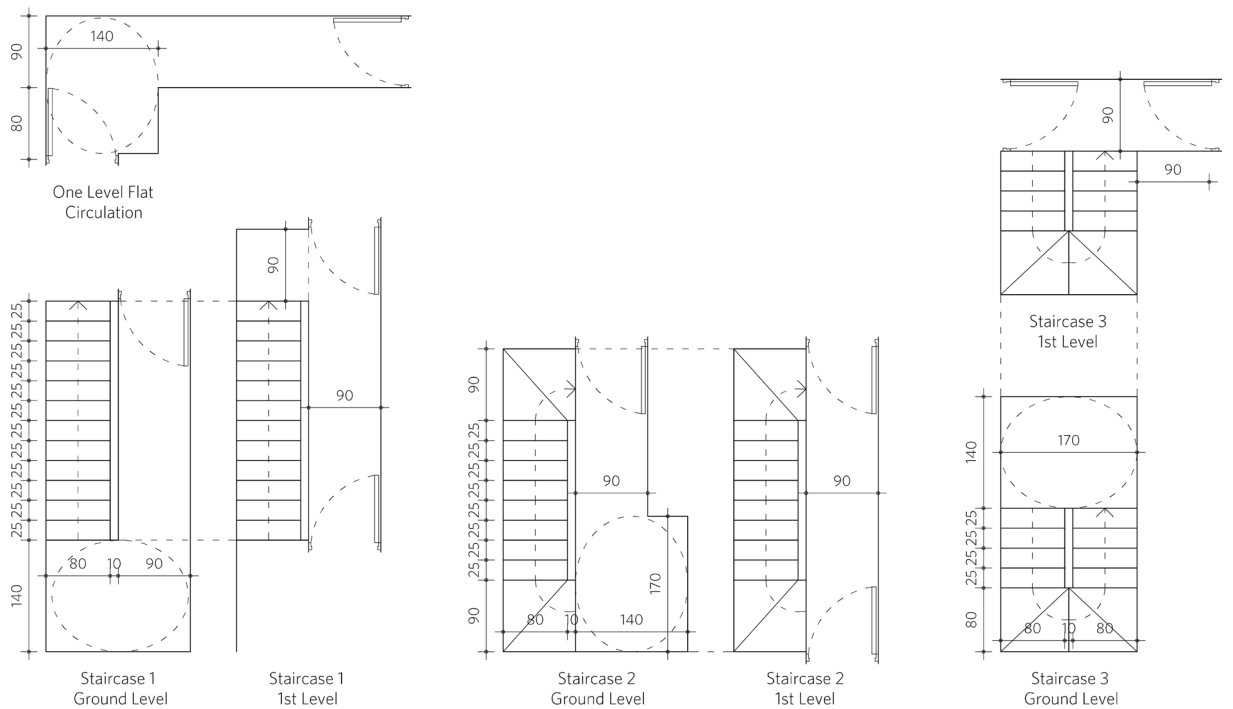


Fig. 4.6

Proposed space standards for the laundry area, kitchen, circulation zones, dining area, bedrooms, family-living room, corridors and staircases.

4.4 ACCESSIBILITY AND ROOM ARRANGEMENTS

Including accessibility criteria should be a fundamental concern in the creation of room arrangements, including all forms of housing, age groups (from children to the elderly), and people with disabilities. **A critical aspect of accessible dwelling design is the bathroom. Usually just seen as a problem of efficiency in use, the typical outcome is a small bathroom that is inaccessible for a wheelchair user.** Such attitude is the same for mid- or large-sized dwellings. In these cases, instead of increasing the space standards of the bathroom, they replicate the same 'efficient' design solution. Against this approach, this guide proposes the following criteria for accessible dwelling design:

- 1 accessible bathroom per dwelling
- The bathroom should be strategically located in order to be easily accessed from all rooms
- Bathrooms should have natural ventilation and natural lighting (except in single aspect dwelling arrangements). One way of achieving this is to create a service core, putting the bathroom window towards the laundry area.
- The dining kitchen, laundry room, and master bedroom should include a wheelchair turning circle
- Standard bedrooms and family room can be exempt from accessibility criteria

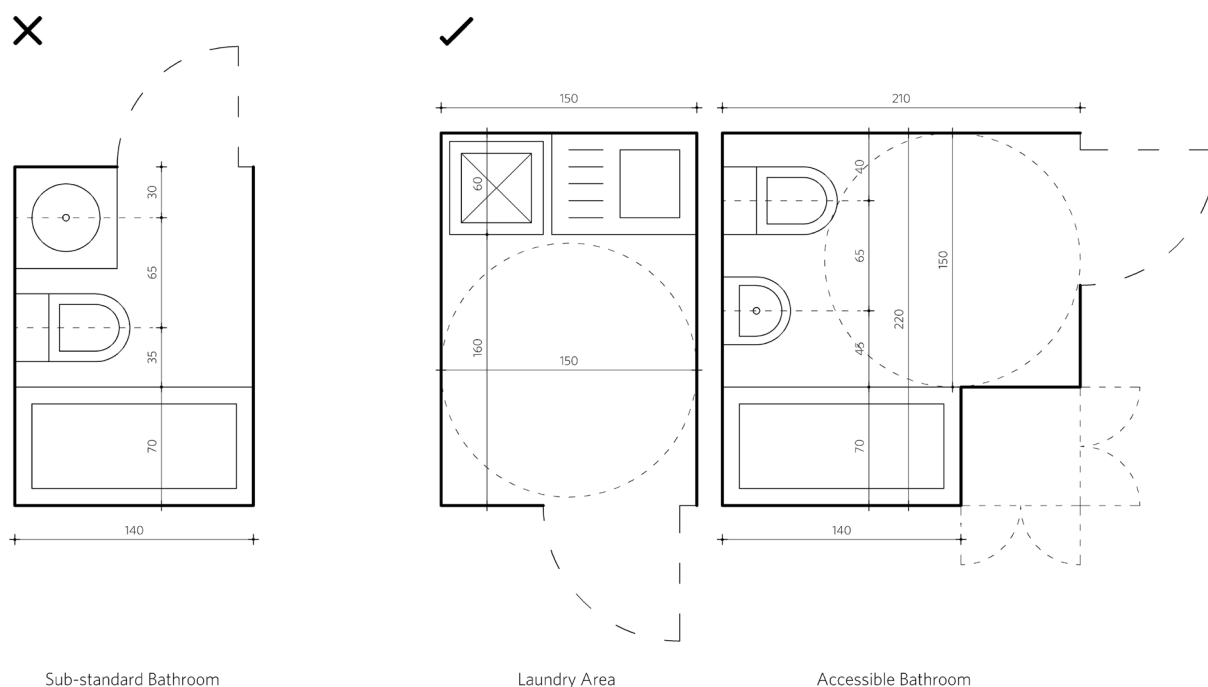


Fig. 4.7
Non-accessible bathroom versus accessible bathroom and laundry area.

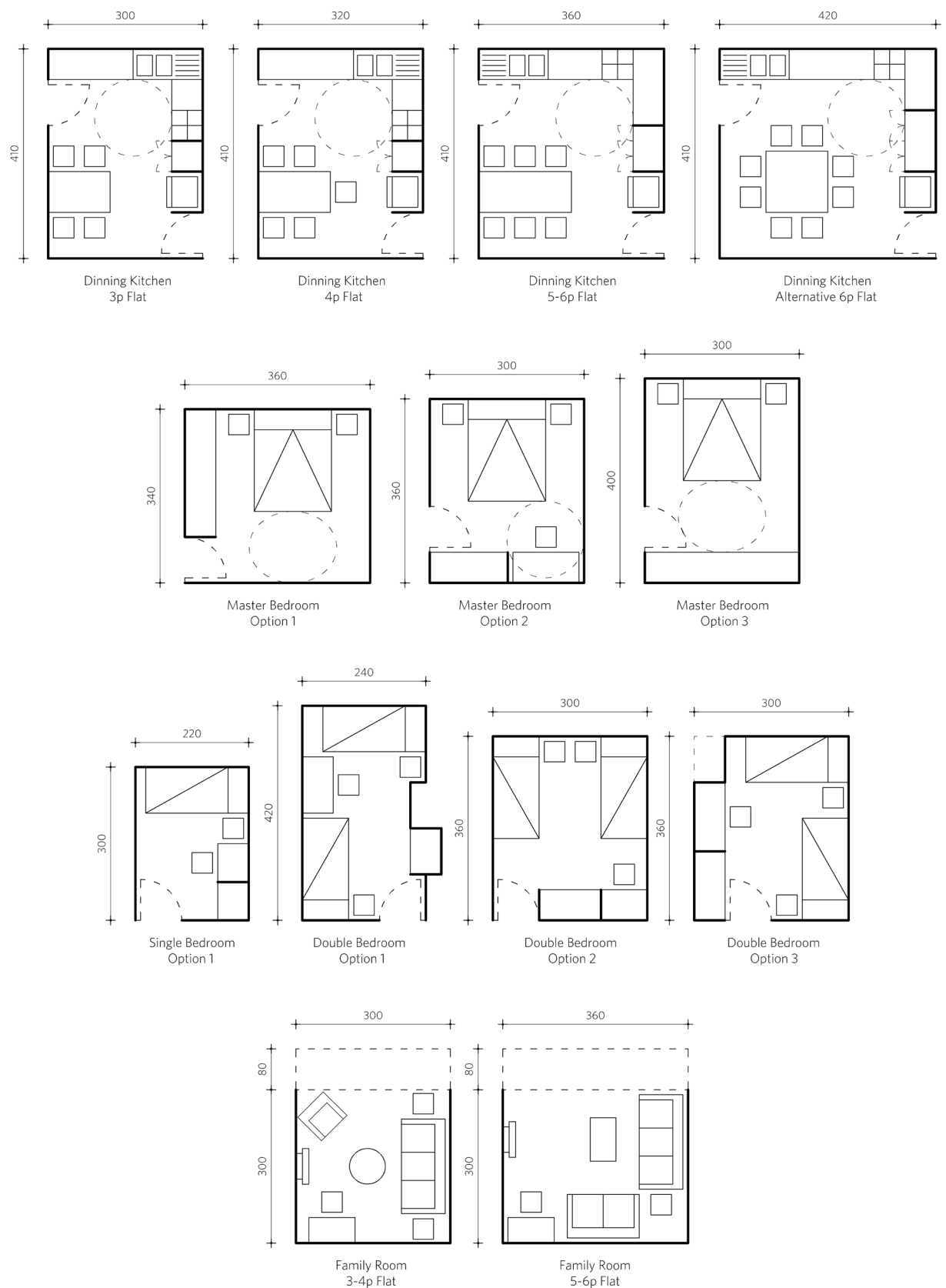


Fig. 4.8
Proposed minimum room standards for the dining kitchen, master bedroom, standard bedrooms, and family room.

4.5 DWELLING ARRANGEMENTS

While space standards are fixed, the way they are assembled cannot be standardized and it is the task of architects to find a way to resolve this adequately. In spite of that, **the process of translating space standards and a dwelling programme into a final dwelling solution can be problematic. The risk is producing an inefficient layout design, which can impact in the general performance or affordability of dwellings.** To address this better, here it is possible to find a broad range of dwelling arrangements. Apart from providing examples for a 2-bedroom flat – understood as the most demanded dwelling programme responding to the typical low- and mid-income household structure (3 to 4 people) – this guide also suggests solutions that respond to different household structures and forms of housing, which are applied according to single, double, and corner aspects. The proposed solutions respond to the following dwelling sizes:

Small-Sized Dwellings

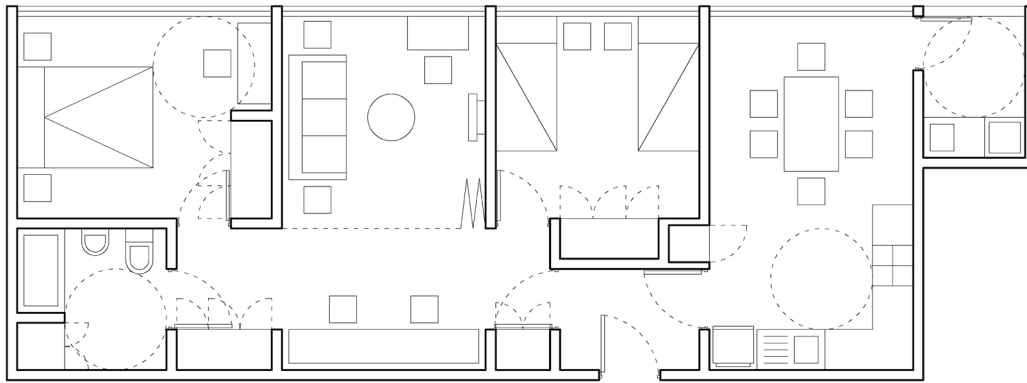
- 1 Person – 1 Bed: 36-40 m²
- 2 Person – 1 Bed: 40-45 m²

Mid-Sized Dwellings

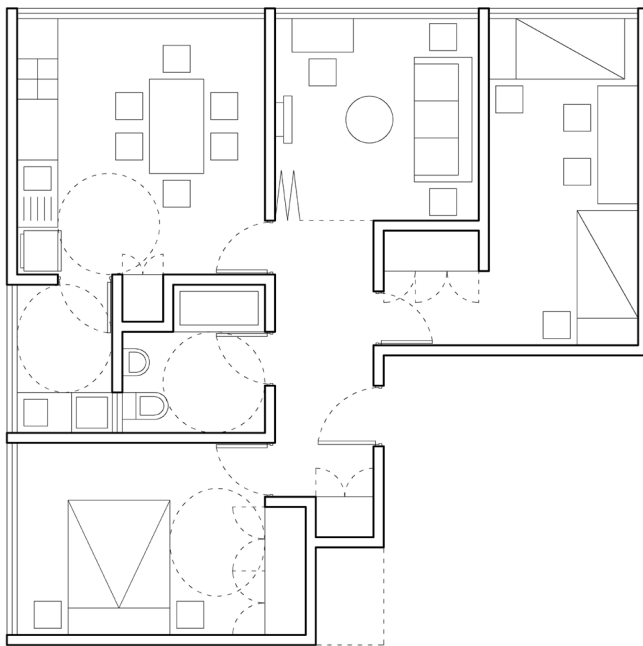
- 3 Person – 2 Bed: 54-63 m²
- 4 Person – 2 Bed: 65-69 m²

Large-Sized Dwellings

- 5 Person – 3 Bed: 69-78 m²
- 6 Person – 3 Bed: 74-88 m²

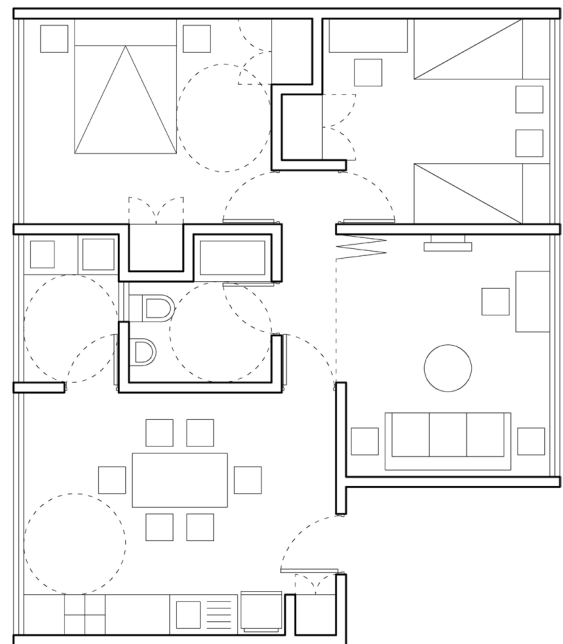


Single Aspect 2 Bedroom Flat



Corner Aspect 2 Bedroom Flat

In the case of single aspect arrangements, it is desirable to locate the main services (bathroom and laundry area) in the sides of the flat, whereas in the case of corner and double aspect arrangements, it is more likely to concentrate the services in one point (ventilating bathrooms through the laundry area), locating them in the middle of the layout. This criteria is particularly critical for corner arrangements, which allows to make use of the corner and therefore have longer views towards the outside and better natural lighting and ventilation in the more public area of the flat.


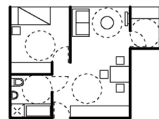

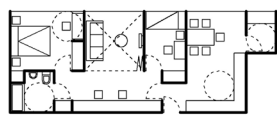
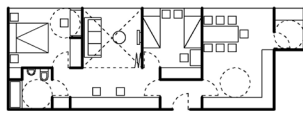
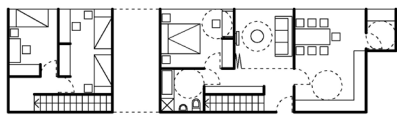
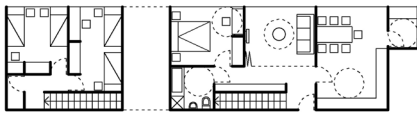


Double Aspect 2 Bedroom Flat

Although the 3 proposed layouts respond to a social housing dwelling arrangement, the layout can easily be transformed and become conventional dwelling arrangement with an integrated living and dining room, as explained in the Household Structure and Flexibility section (p. 96-97)



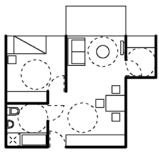
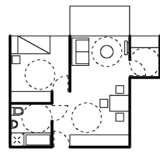

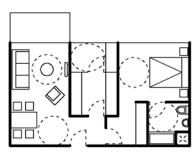
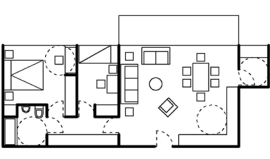
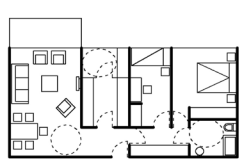
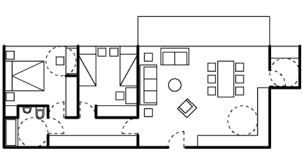

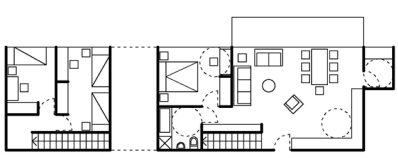
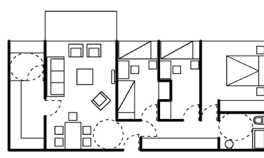
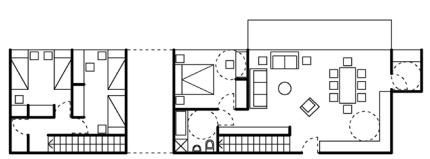

Fig. 4.9

Examples of the application of minimum room standards in 2-bedroom / 4 people flat responding to single, corner, and double aspect dwelling arrangement.

	 <p>Social Housing (Non-conventional Arrangement)</p>
1-Person 1-Bed Elderly 36-40m ²	
2-Persons 1-Bed Young Couple or Elderly 40-45m ²	
3-Persons 2-Bed Medium-Sized Household 54-63m ²	
4-Persons 2-Bed Medium-Sized Household 65-69m ²	
5-Persons 3-Bed Large-Sized Household 69-78m ²	
6-Persons 3-Bed Large-Sized Household 74-88m ²	

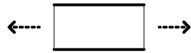


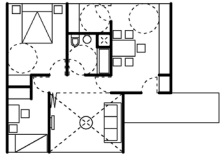
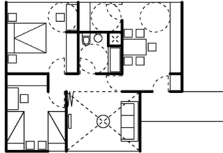
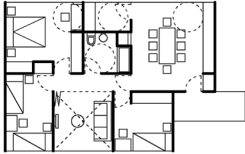
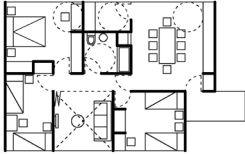
The social housing and affordable housing solutions that are proposed here are interchangeable by differentiating or bringing together the dining kitchen and the family room (living room in the case of conventional arrangements), whereas the private housing solutions are fixed due to they are equipped with a kitchen without a dining table. In spite of their differences, all the dwelling solutions respond to the accessible criteria and minimum space standards described in previous sections.

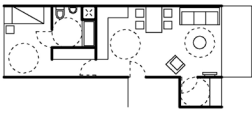
Fig. 4.10
Proposed possibilities of single aspect dwelling solutions for social housing, affordable housing, and private housing according to non-conventional and conventional arrangements, ranging from 1-person to 6-persons flats.

 <p>Affordable or Private Housing (Non-conventional Arrangement)</p>	 <p>Private Housing (Conventional Arrangement)</p>
	
	
	
	
	
	

The social housing and affordable housing solutions that are proposed here are interchangeable by differentiating or bringing together the dining kitchen and the family room (living room in the case of conventional arrangements), whereas the private housing solutions are fixed due to they are equipped with a kitchen without a dining table. In spite of their differences, all the dwelling solutions respond to the accessible criteria and minimum space standards described in previous sections.

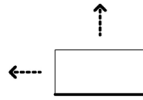

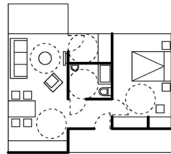
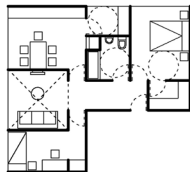
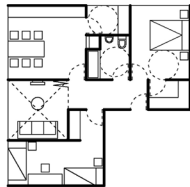
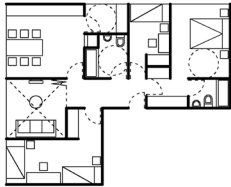

Fig. 4.11
Proposed possibilities of double aspect dwelling solutions for social housing, affordable housing, and private housing according to non-conventional and conventional arrangements, ranging from 1-person to 6-persons flats.

	 <p>Social Housing (Non-conventional Arrangement)</p>
1-Person 1-Bed Elderly 36-40m ²	
2-Persons 1-Bed Young Couple or Elderly 40-45m ²	
3-Persons 2-Bed Medium-Sized Household 54-63m ²	
4-Persons 2-Bed Medium-Sized Household 65-69m ²	
5-Persons 3-Bed Large-Sized Household 69-78m ²	
6-Persons 3-Bed Large-Sized Household 74-88m ²	

 <p>Affordable or Private Housing (Non-conventional Arrangement)</p>	 <p>Private Housing (Conventional Arrangement)</p>
	
	
	
	
	
	

The social housing and affordable housing solutions that are proposed here are interchangeable by differentiating or bringing together the dining kitchen and the family room (living room in the case of conventional arrangements), whereas the private housing solutions are fixed due to they are equipped with a kitchen without a dining table. In spite of their differences, all the dwelling solutions respond to the accessible criteria and minimum space standards described in previous sections.

Fig. 4.12
Proposed possibilities of corner aspect dwelling solutions for social housing, affordable housing, and private housing according to non-conventional and conventional arrangements, ranging from 1-person to 6-persons flats.

	 <p>Social Housing (Non-conventional Arrangement)</p>
1-Person 1-Bed Elderly 36-40m ²	
2-Persons 1-Bed Young Couple or Elderly 40-45m ²	
3-Persons 2-Bed Medium-Sized Household 54-63m ²	
4-Persons 2-Bed Medium-Sized Household 65-69m ²	
5-Persons 3-Bed Large-Sized Household 69-78m ²	
6-Persons 3-Bed Large-Sized Household 74-88m ²	

 <p>Affordable or Private Housing (Non-conventional Arrangement)</p>	 <p>Private Housing (Conventional Arrangement)</p>
	
	
	
	
	
	

4.6 COMMUNAL PROGRAMME

The minimum dwelling should not be understood as a self-sufficient unit but in relation to a communal programme that can both respond to domestic needs and install socio-educative principles at the interior of family life. **The communal programme is seen as a mechanism to create a safe environment where individuals can spend part of the day interacting with neighbours and carrying out domestic activities that cannot be solved within the dwelling unit either for space problems or the absence of parents.** This way, this space becomes a necessary expansion of the minimum dwelling programme. Communal programmes should include the following:

- **Nursing:** playing and sleeping areas
- **Studying:** quiet room (mainly intended for after-school hours)
- **Social:** lounge for the elderly and area for communal meetings
- **Services:** kitchen and pantry area, differentiated bathrooms for children and adults, and staff office

The communal programme can be run by neighbours (self-organized) or the municipality (external administrator that puts in charge a teacher or nurse), depending on each case. For social housing, the presence of a public agent can be a critical factor for an adequate surveillance and administration of these programmes.

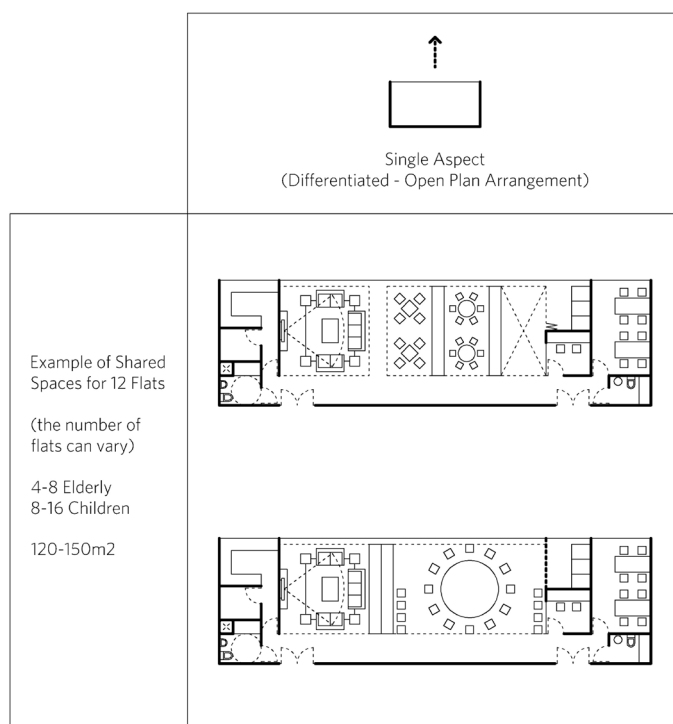


Fig. 4.13
Proposed possibilities of communal programme according to single aspect, double aspect, and corner aspect arrangements.

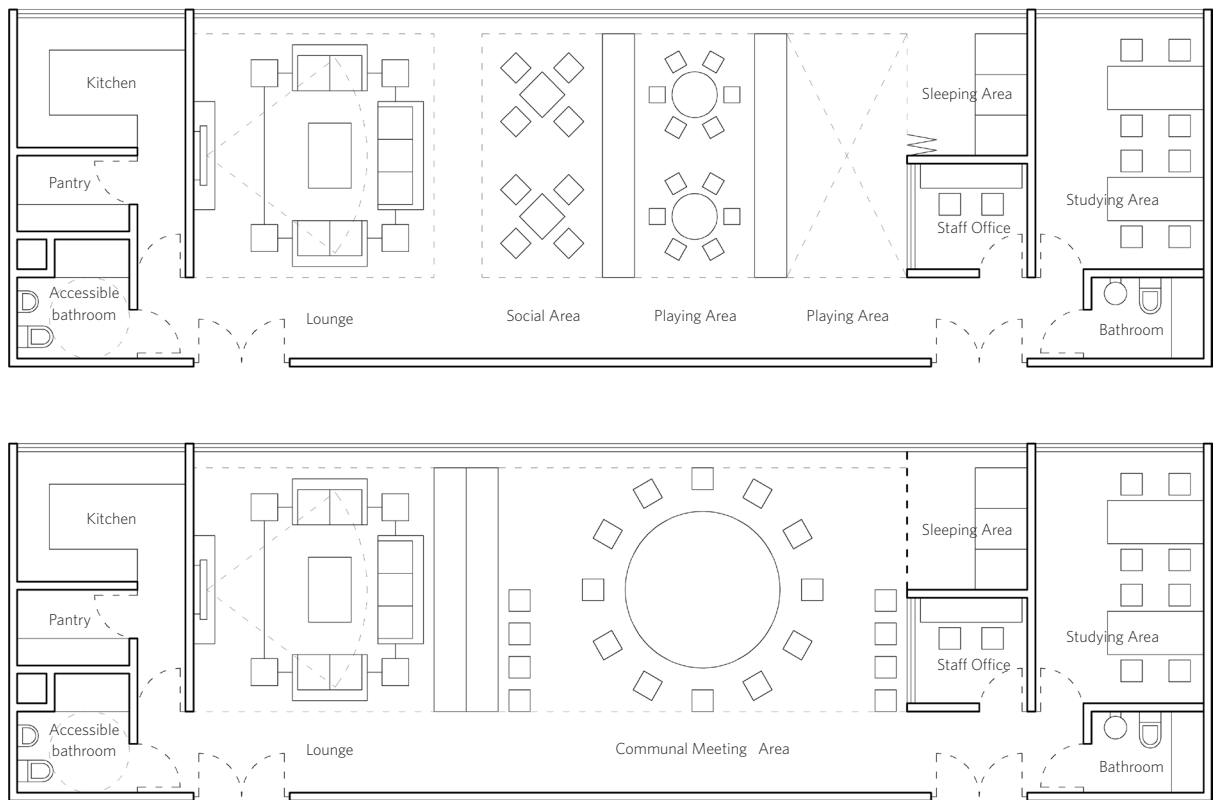
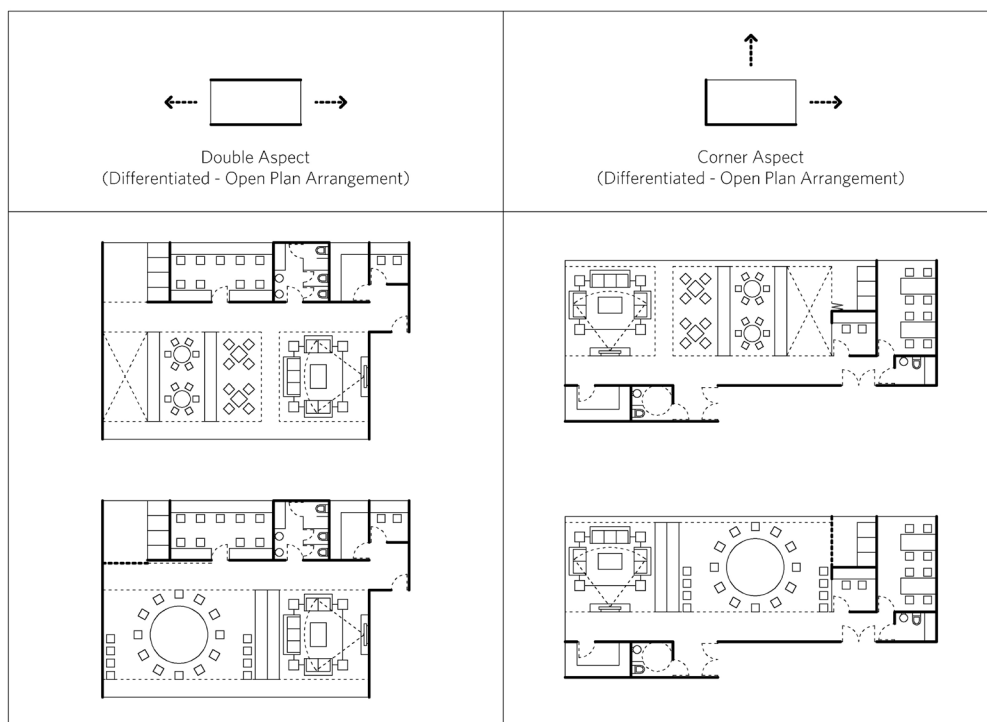


Fig. 4.14
Floor plan of a communal programme arrangement (layouts according to different uses).



INTER-SCALAR RELATIONSHIPS

5

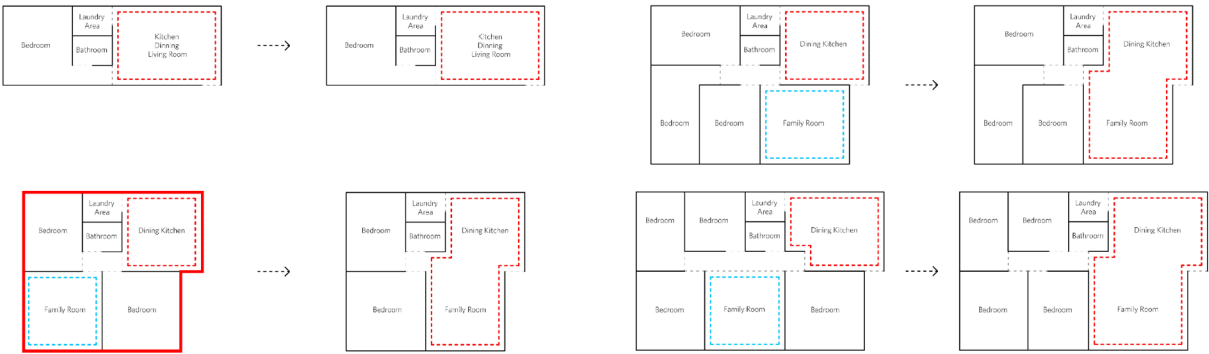
5.1 ASSEMBLY OF THE GUIDE'S SECTIONS

The purpose of this section is to clarify the compatibility and multiple relationships among the different standards and design criteria proposed in the previous sections of the guide. Although the guide develops from the large scale to the small scale, this section is organized in the opposite way, which allows to understand the aggregative process of design, from isolated instances to a number of assemblies, and finally to their supporting regulatory structure.

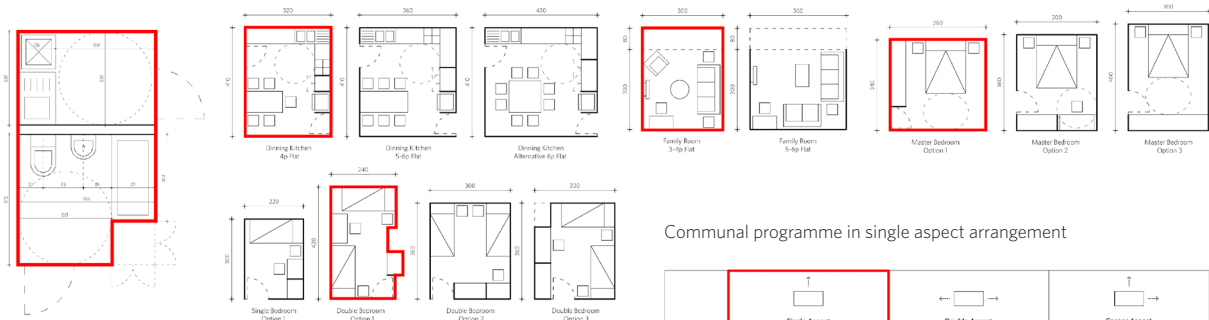
5.2 DWELLING

The process starts with defining a household structure and its corresponding dwelling programme. The example that is given here responds to a family of 4 persons in conditions of social vulnerability, which leads to choose a 2 bedroom flat with a non-conventional arrangement. With the programme already defined, it is now possible to go the room standards and define the main elements to be assembled in a dwelling layout. The programme and room standards are applied in a corner aspect arrangement that concentrates the bathroom and laundry in a service core located in the centre of the layout. This design criteria allows to both minimize the amount of circulations, and provide visual hierarchy to the dining kitchen – the most public and demanded function of the dwelling programme – by placing it in the flat's corner. Such a scheme is not an isolated solution but comes from a range of possible dwelling arrangements determined by the family size and the specific conditions of the building, which can ask for single, double or corner aspect arrangements. In parallel to this, it is also necessary to choose a communal facility that complements the minimum dwelling programme, which in this case responds to a double aspect arrangement.

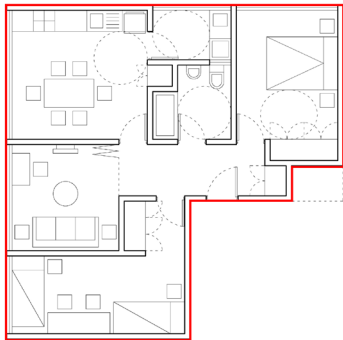
Dwelling programme for a 2 bedroom flat with non-conventional arrangement



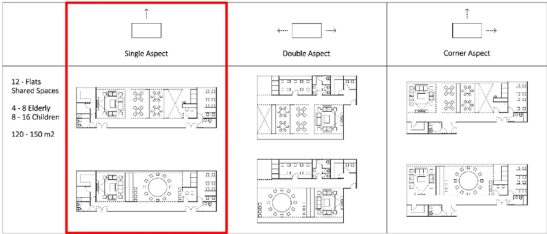
Room standards



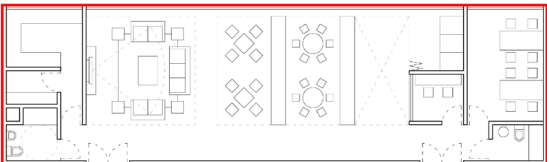
Dwelling arrangement:
assembly of programme and standards



Communal programme in single aspect arrangement



Arrangement of communal facility



Dwelling arrangement in ranges of dwelling solutions

	Social Housing	Affordable Housing	Private Housing	Social Housing	Affordable Housing	Private Housing	Social Housing	Affordable Housing	Private Housing
1 - Person 1 - Bed Elderly 50 - 60 m ²									
2 - Person 1 - Bed Elderly 60 - 65 m ²									
3 - Person 2 - Bed Medium-Sized Household 54 - 63 m ²									
4 - Person 2 - Bed Medium-Sized Household 65 - 69 m ²									
5 - Person 3 - Bed Medium-Sized Household 69 - 78 m ²									
6 - Person 3 - Bed Large-Sized Household 74 - 88 m ²									

5.3 BUILDING AND BLOCK

From the Dwelling section, the chosen dwelling and communal facility solutions have the ability to determine specific building and block arrangements.

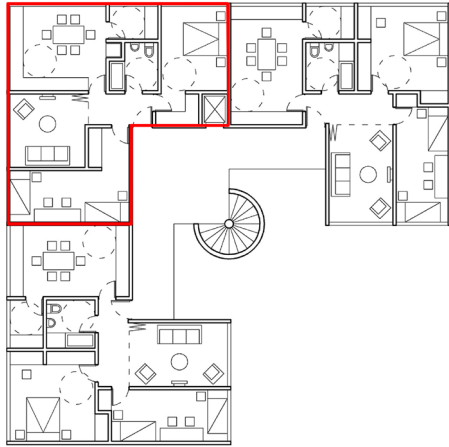
On the one hand, the dwelling solution participates of an assembly of 3 units per level – provided with an independent vertical circulation – whose proliferation can create different arrangements of multi-courtyard housing blocks. Of these, it is chosen one of 40x100 meters that responds to the following criteria:

- Mixed use: overlapped (flats, row houses, commercial areas, and parking)
- Visual and physical relationship with the street: 1/2 floor lifted housing (option 2)
- Parking areas: underground
- Minimum horizontal circulations: corner vertical circulations
- Arrangement of different functions-uses and accesses: integrated courtyard and arrangement of socio-educative facilities
- Disposition of socio-educative facilities in relation to communal open space: hierarchical and singular

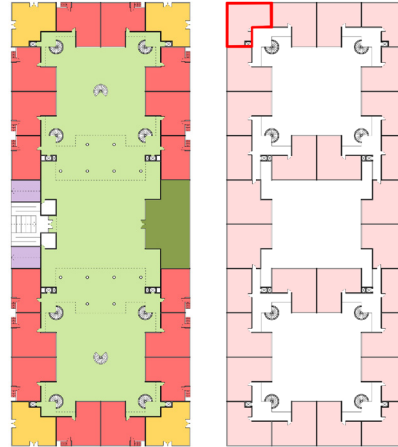
On the other hand, the communal facility is part of a school, which develops in a linear block arrangement that also responds to a size of 40x100 meters. The communal facility is at the ground floor level and is located at the upper end of the block – complemented by another communal facility (library) at the opposite end – allowing it to be used by both students and the community, depending on the time of the day. The main criteria is the following:

- Mixed use: juxtaposed (school, housing slab block, commercial areas, and parking)
- Visual and physical relationship with the street: 1st floor housing (ground floor for commercial or communal use)
- Parking areas: underground
- Minimum horizontal circulations: multiple vertical cores and short horizontal circulations
- Arrangement of different functions-uses and accesses: segregated courtyard and integrated arrangement of communal facility
- Disposition of socio-educative facilities in relation to communal open space: hierarchical and multiple (threshold arrangement)

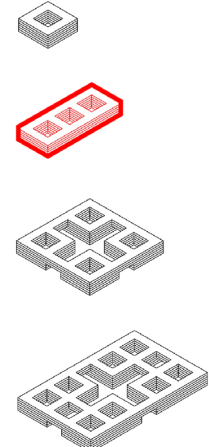
Dwelling Arrangement in compound of Dwellings



Compound of dwellings in multi-courtyard block arrangement

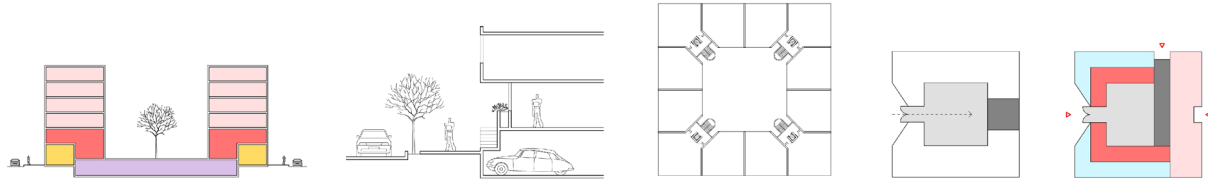


Proliferation potential of courtyard arrangement

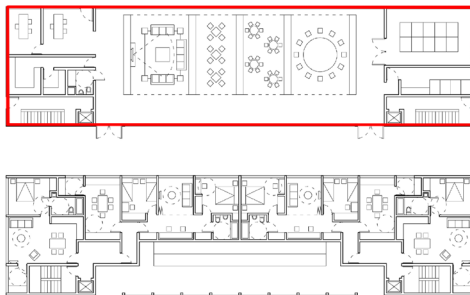


Main design criteria for multi-courtyard block:

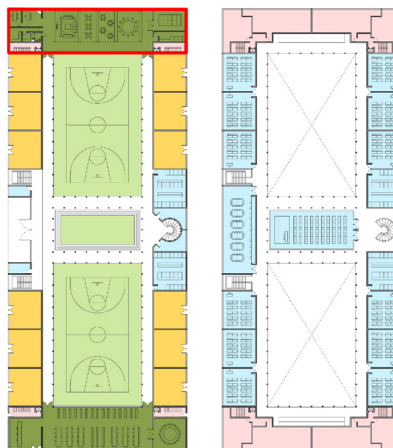
Overlapping of uses, 1/2 floor lifted housing and underground parking, corner vertical circulations, hierarchical disposition of communal facility, and integrated courtyard arrangement of communal programme.



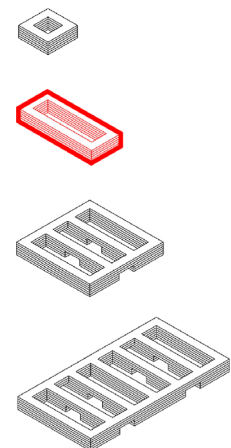
Communal facility and overlapping of housing in slab block arrangement.



Communal facility in linear courtyard block arrangement

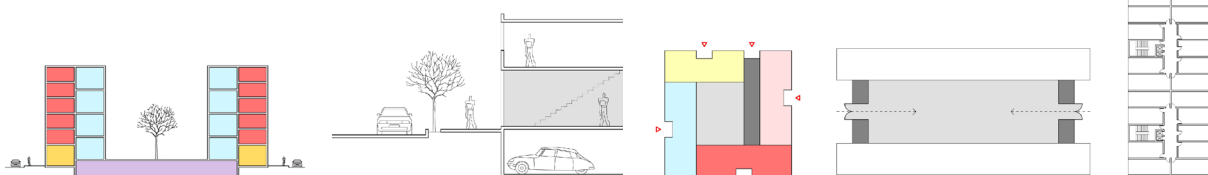


Proliferation potential of courtyard arrangement



Main design criteria for linear courtyard block:

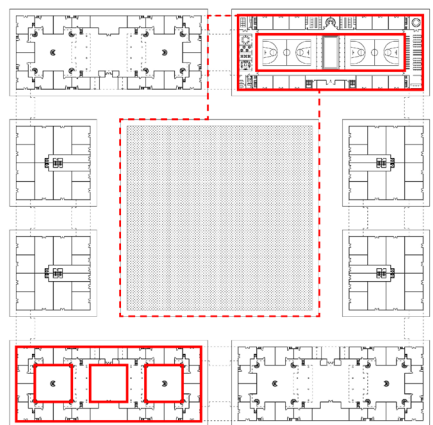
Juxtaposition of uses, 1st floor housing (ground floor for commercial or communal use) and underground parking, hierarchical and multiple disposition of communal programme, segregated courtyard and integrated arrangement of communal facility, and short horizontal circulations.



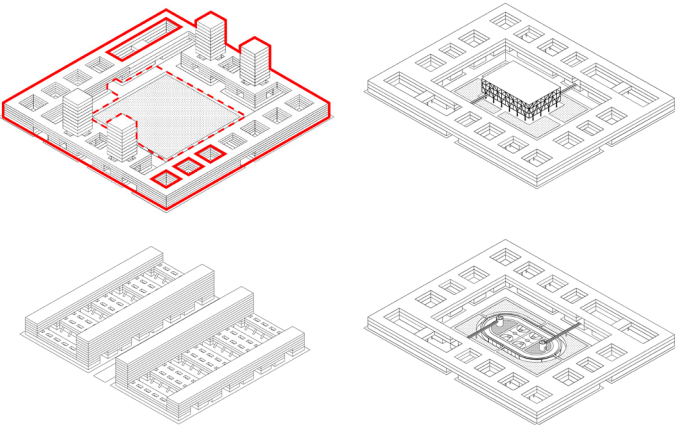
5.4 NEIGHBOURHOOD

From the Building and Block section, the multi-courtyard block and linear courtyard block solutions are combined in order to create a neighbourhood sub-centre, whose arrangement is determined by a public square as organizing urban element. The sub-centre is one of the 4 main neighbourhood arrangements, which are: infrastructural plinth (neighbourhood sub-centre), civic centre (neighbourhood centre), leisure centre (neighbourhood centre), and boulevard. The spatial outcome of the sub-centre arrangement corresponds to the final phase of the tertiary infrastructural development system within 4 blocks. At the same time, this arrangement is part of the second phase of the secondary infrastructural development system that also includes 2 boulevards and a neighbourhood centre. Finally, such an urban scheme is the one needed to complete the first phase of the primary infrastructural development system in linear arrangements.

Linear courtyard block and multi-courtyard block in neighbourhood sub-centre arrangement



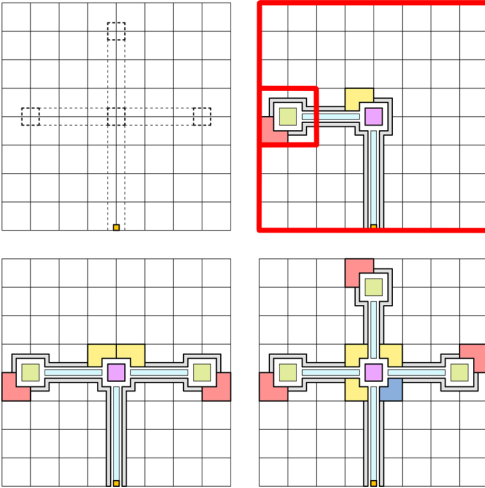
Neighbourhood sub-centre in examples of neighbourhood arrangements (infrastructural plinth, civic centre, boulevard, and leisure centre)



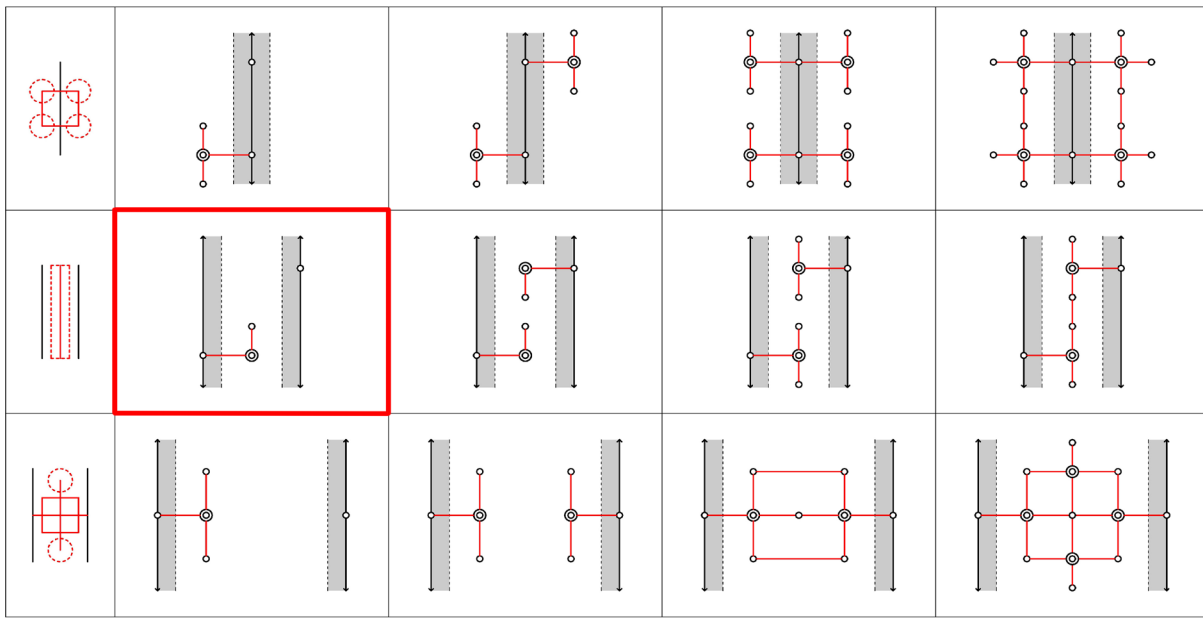
Final phase of neighbourhood sub-centre in tertiary infrastructural development system



Neighbourhood sub-centre in Phase II of secondary infrastructural development system



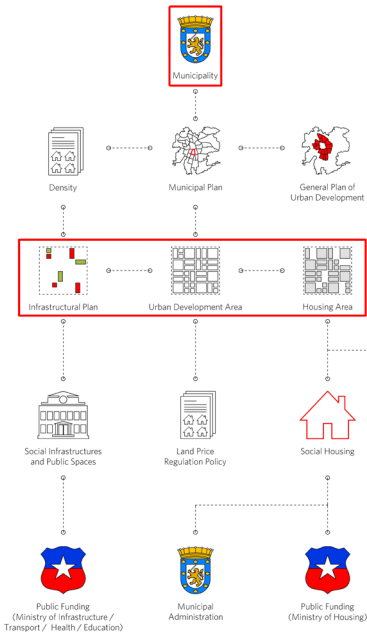
Phase II of secondary system in Phase I of primary infrastructural development system



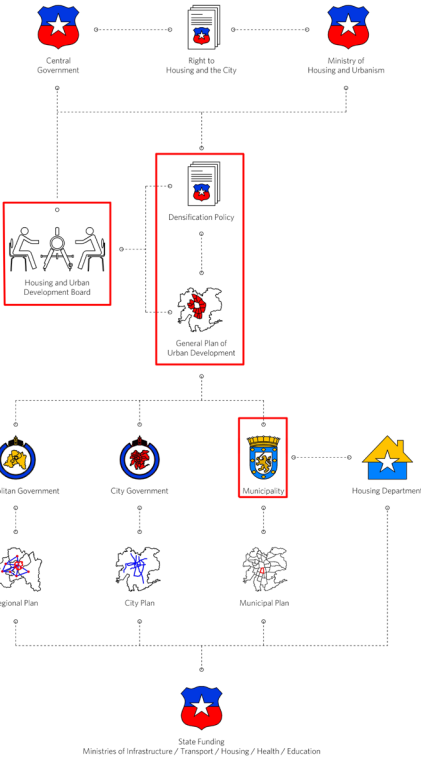
5.5 POLICY AND PLANNING

The possibility of creating neighbourhood arrangements is given by a municipal planning system that defines the specific areas subject to the provision of housing and infrastructure. The application of the planning system depends on a supporting densification policy and a General Plan of Urban Development that demarcates 4 large districts (northern, southern, eastern, and western). In doing so, the number of municipalities in which the densification policy can be enforced is limited. This way, the municipality is not anymore a totally independent administrative entity but should follow the guidelines that the Housing and Urban Development Board sets.

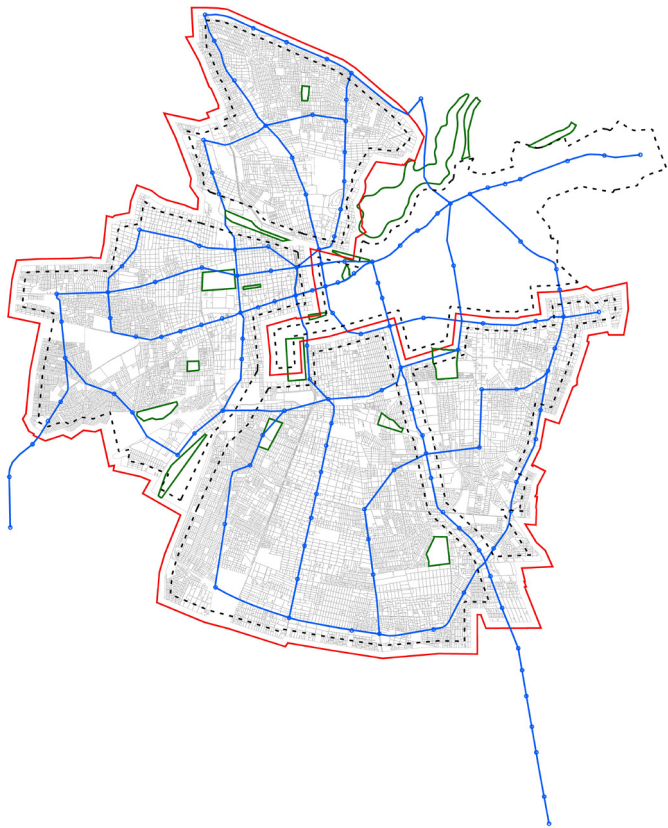
Planning of areas for the provision of housing and infrastructure and the municipality as the main driver of the planning process



The municipality is subject to a densification policy, an urban plan, and an external assessment



The General Plan of Urban Development defines 4 zones for the provision of housing and infrastructure



BIBLIOGRAPHY

- Aravena, Alejandro, Andres Iacobelli, *Elemental: Incremental housing and participatory design manual* (Ostfildern: Hatje Cantz, 2012)
- Aravena, Alejandro, José De Gregorio, Iván Poduje, 'Vía rápida para reducir la desigualdad: propuestas para revertir la segregación urbana en nuestras ciudades [Fast track to reduce the inequality: proposals to reverse urban segregation in our cities]', *Espacio Público: Informe de Políticas Públicas*, 02 (2013), 1-40
- Aravena, Susana, Alejandra Sandoval, *Política Habitacional y Actores Urbanos [Housing Policy and Urban Stakeholders]* (Santiago: Ediciones SUR, 2006)
- Argan, Giulio Carlo, 'On the Typology of Architecture', in *Theorizing a New Agenda for Architecture*, ed. by Kate Nesbitt (New York: Princeton Architectural Press, 1996), pp. 240-246
- Arteaga, Oscar, 'El cité en el origen de la vivienda chilena [The cité in the origin of Chilean housing]', CA. *Revista Oficial del Colegio de Arquitectos de Chile*, 41 (1985), 18-21 (p.18)
- Asociación de Investigadores de Mercado (AIM), *Informe Grupos Socioeconómicos (GSE) 2012* [Socioeconomic Report 2012] < <http://www.aimchile.cl/wp-content/uploads/INFORME-SOCIOECONOMICO.pdf> > [accessed 15 March 2016]
- Atria, Fernando, Guillermo Larraín, José Miguel Benavente, Javier Couso, Alfredo Joignant, *El Otro Modelo: del orden neoliberal al régimen de lo público [The Other Model: from the neoliberal order to the public regime]* (Santiago: Random House Mondadori, 2013)
- Atria, Fernando, *Neoliberalismo con Rostro Humano: veinte años después [Neoliberalism with Human Face: twenty years later]* (Santiago: Editorial Catalonia, 2013)
- ATISBA, *Reportes: Guetos en Chile [Reports: Ghettos in Chile]* (Santiago: Atisba Estudios & Proyectos Urbanos, 2010)
- Azocar, Javiera, 'Política chilena de vivienda social: una mirada a su concepto de espacio público en la posmodernidad [Chilean social housing policy: a look at its concept of public space in postmodernity]', *Revista INVI*, 57 (2006), 10-43
- Bandini, Micha, 'Typology as a Form of Convention', *AA Files*, 6 (1984), 73-82
- Barton, Jonathan, 'State Continuismo and Pinochetismo: the keys to the Chilean transition', *Bulletin of Latin American Research*, 3, (2002), 358-374
- Beng Huat, Chua, 'Public-housing policies compared: United States, ex-socialist nations and Singapore', in *Political Legitimacy and Housing: Singapore's Stakeholder Society* (London: Routledge, 1997), pp.12-26

- Bischof, Raphael, Danielle Klintowitz, Joyce Reis, Raquel Rolnik, *Como produzir moradia bem localizada com os recursos do Programa Minha Casa Minha Vida?* [How to achieve a well located house with the funds of the Minha Casa Minha Vida Programme?] (Sao Paulo: Secretaria Nacional de Programas Urbanos, Brasil, 2010)
- Borsi, Katharina, 'Drawing and Dispute: The Strategies of the Berlin Block', in *Intimate Metropolis: Urban Subjects in the Modern City*, ed. by Vitoria di Palma, Diana Periton, Marina Lathouri (New York: Routledge, 2009), pp. 132-152
- Boyd, Gary A., 'Parker Morris and the Economies of the Fordist House', in *Economy and Architecture*, ed. by Stephen Kite, Mhairi McVicar, Juliet Odgers (London: Routledge, 2015), pp. 38-48
- Boza, Cristián, *100 años de Arquitectura Chilena [100 Years of Chilean Architecture]* (Santiago: Hunter Douglas, 1996)
- Cáceres, Gonzalo, Francisco Sabatini, *Barrios Cerrados en Santiago de Chile: entre la exclusión y la integración residencial* [Gated Communities in Santiago de Chile: between exclusion and residential integration] (Santiago: Pontificia Universidad Católica de Chile, Instituto de Geografía, 2004)
- Cachola, Peter, Claudia Quiring, Wolfgang Voigt, Eckhard Herrel, *Ernst May 1886-1970* (Munich: Prestel, 2011)
- Caja de Crédito Hipotecario, *Población Huemul: Inauguración de la Sección Beneficencia [Población Huemul: Beneficence Section Inauguration]* (Santiago: Sociedad Imp. Lit. Barcelona, 1918)
- Canguilhem, Georges, *On the Normal and the Pathological* (New York: Zone Books, 1978)
- Carmo, Mario, 'The Architectural Principles of Temperate Classicism: Merchant Dwellings in Sebastiano Serlio's Sixth Book', *RES: Anthropology and Aesthetics*, 22 (1992), 135-151
- Castillo, María José, Rodrigo Hidalgo, *1906/2006, Cien años de política de vivienda en Chile [1906/2006, One hundred years of housing policy in Chile]* (Santiago: Ediciones UNAB, 2007)
- Chamorro, Claudia, 'Política habitacional en Chile: historia, resultados y desafíos [Housing policy in Chile: history, outcomes, and challenges]', *Working Papers: Chilean Construction Chamber*, 72 (2013) 1-52
- Colquhoun, Alan, 'Composition versus the Project', in *Collected Essays in Architectural Criticism* (London: Black Dog, 2009), pp. 178-183
- Colquhoun, Alan, 'Twentieth-Century Concepts of Urban Space', in *Modernity and Classical Tradition: Architectural Essays 1980 - 1987* (Cambridge, MA and London: MIT Press, 1994) pp. 223-233 (p. 226)
- Colquhoun, Alan, 'Typology and Design Method', in *Collected Essays in Architectural Criticism* (London: Black Dog, 2009), pp. 45-51
- County Council of Essex, *A Design Guide for Residential Areas* (Essex: The Anchor Press, 1973)

- Davies, Llewelyn, *Urban Design Compendium* (London: Llewelyn-Davies, 2000)
- De Mattos, Carlos, María Elena Ducci, Alfredo Rodríguez, Gloria Yáñez, *Santiago en la globalización: ¿una nueva ciudad? [Santiago under globalization: a new city?]* (Santiago: Ediciones SUR - Eure Libros, 2004)
- D'Hooghe, Alexander, 'Siberia as Analogous Territory: Soviet Planning and the Development of Science Towns', *AA Files*, 51 (2004), 14 – 27, (p. 23).
- Donzelot, Jacques, *The Policing of Families* (London: Hutchinson, 1980)
- Dubut, Louis-Ambroise, *Architecture Civile* (Unterschneidheim: Walter Uhl, 1974)
- Durand, Jean-Nicolas-Louis, *Précis of the Lectures on Architecture*, trans. by David Britt (Los Angeles: Getty Publications, 2000)
- Elemental Chile, *Documental Quinta Monroy* [Quinta Monroy Housing Documentary] <<http://www.elementalchile.cl/en/projects/quinta-monroy/>> [accessed 23 August 2016]
- Esping-Andersen, Gøsta, *The Three Worlds of Welfare Capitalism* (Cambridge: Polity Press, 1990)
- Essex Planning Officers Association, *A Design Guide for Residential Areas* (Essex: Essex County Council, 1973)
- Essex Planning Officers Association, *The Essex Design Guide for Residential and Mixed Use Areas* (Essex: Essex County Council, 1997)
- Essex Planning Officers Association, *The Essex Design Guide* (Essex: Essex County Council, 2005)
- Facultad de Arquitectura y Urbanismo Universidad de Chile, Instituto de la Vivienda Universidad de Chile, Universidad Técnica Federico Santa María, Fundación Chile, *Bienestar Habitacional: Guía de Diseño para un Hábitat Residencial Sustentable [Housing Welfare: Design Guide for Residential Sustainable Habitat]* (Santiago: Instituto de la Vivienda / F.A.U. / U. de Chile, 2004)
- Feddersen, Eckhard, *Living for the Elderly: a design manual* (Basel: Birkhäuser, 2009)
- Forty, Adrian, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames & Hudson, 2000)
- Foucault, Michel, *The Birth of Biopolitics: Lectures at the Collège de France, 1978-1979*, trans. by Graham Burchell (Basingstoke : Palgrave Macmillan, 2010)
- Frolic, Michael, 'The Soviet City', *The Town Planning Review*, Vol 34, No. 4 (1964), 285-306.
- Galetovic, Alexander, *Santiago: Dónde estamos y hacia dónde vamos [Santiago: Where we are and where we are going]* (Santiago: Centro de Estudios Públicos, 2006)
- García-Huidobro, Juan Eduardo, *Educación Inclusiva y Democracia [Inclusive Education and Democracy]* (Santiago: Universidad Alberto Hurtado, 2013) <<http://biblioteca.uahurtado.cl/ujah/reduc/pdf/pdf/pdf/txt1058.pdf>> [accessed 25 July 2016]

- Great Britain, Ministry of Health, Ministry of Works, *Housing Manual*, 1944 (London: H.M.S.O, 1944)
- Great Britain, Ministry of Health, *Housing Manual*, 1949 (London: H.M.S.O, 1949)
- Great Britain, Ministry of Housing and Local Government, *Houses 1953: Third Supplement to the Housing Manual 1949* (London: H.M.S.O, 1953)
- Great Britain, Ministry of Housing and Local Government, *Homes for Today and Tomorrow* (London: H.M.S.O, 1961)
- Gropius, Walter, *The New Architecture and the Bauhaus* (Cambridge, MA: MIT Press, 1965)
- Guthrie, Pat, *The Architect's Portable Handbook: First-Step Rules of Thumb for Building Design* (New York: McGraw-Hill, 1976)
- Habinteg Housing Association, *Design guide and technical manual for accessible new build housing* (London: Habinteg Housing Association, 1992)
- Habinteg Housing Association, *Lifetime Homes Design Guide* (London: BRE Press, 2011)
- Harvey, David, *A brief history of neoliberalism* (New York: Oxford University Press, 2005)
- Harvey, David, *Rebel Cities: From the Right to the City to the Urban Revolution* (London: Verso, 2012)
- Harvey, David, *The Urban Experience* (Oxford: Blackwell Publishers, 1992)
- Hidalgo, Rodrigo, 'Continuidad y cambio en un siglo de vivienda social en Chile. Reflexiones a partir del caso de la ciudad de Santiago [Continuity and change in a century of social housing in Chile (1892-1998). Considerations based on the case of Santiago]', *Revista de Geografía Norte Grande*, 26 (1999), 69-77
- Hidalgo, Rodrigo, '¿Se acabó el suelo en la gran ciudad? Las nuevas periferias metropolitanas de la vivienda social en Santiago de Chile [Is it over the land availability in the big city? The new social housing metropolitan peripheries in Santiago de Chile]', *Revista Eure*, 98 (2007), 57-75
- Hidalgo, Rodrigo, Tomás Errázuriz, Rodrigo Booth, 'Las Viviendas de la Beneficencia Católica en Santiago: instituciones, constructoras y efectos urbanos [The Catholic Charity Housing in Santiago: institutions, constructors, and urban effects]', *Revista Historia* (Instituto de Historia Pontificia Universidad Católica de Chile), 38 (2005), 327-366
- Hilberseimer, Ludwig, *Metropolisarchitecture and Selected Essays* (New York: Columbia University Graduate School of Architecture, 2013)
- Jacoby, Sam, 'The Reasoning of Architecture: Type and the Problem of Historicity' (unpublished PhD thesis, Technischen Universität Berlin, 2013)

- Jirón, Paola, Sandra Coquimbo, Alejandro Toro, Luis Goldsack, Jorge Larenas, Javier Quintero, Gustavo Rodriguez, Isabel Zapata, *Observación morfológica del hábitat residencial: determinantes estándares de habitabilidad residencial para mejorar la calidad de la construcción en la vivienda en Chile [Morphological observation of residential habitat: standard determinants of residential habitability to improve the quality of housing construction in Chile]* (Santiago: Instituto de la Vivienda Universidad de Chile, 2002)
- Kemeny, Jim, *Housing and Social Theory* (London: Routledge, 1992)
- Krier, Leon, *The Architecture of Community* (Washington, DC: Island Press, 2009)
- Krier, Leon 'Urban Components', *Architectural Design*, 54 (1984), 43-49
- Krier, Rob, *Urban Space* (London: Academy Editions, 1979)
- Latour, Bruno, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005)
- Lehnerer, Alex, *Grand Urban Rules* (Rotterdam: 010 Publishers, 2009)
- Leupen, Bernard, *Housing Design: a manual* (Rotterdam: NAI Publishers, 2011)
- Lucan, Jacques, *Composition, Non-composition: architecture and theory in the nineteenth and twentieth centuries*, trans. by Theo Hakola (Abingdon : Routledge, 2012)
- Mayor of London, *London Housing Design Guide* (London: Palestra, 2009)
- Mayor of London, *London Housing Design Guide* (London: Palestra, 2010)
- Ministerio de Vivienda y Urbanismo, Ministerio del Interior, Fundación Paz Ciudadana, *Espacios Urbanos Seguros: Recomendaciones de diseño y gestión comunitaria para la obtención de espacios urbanos seguros [Safe Urban Spaces, Design guides and community management for obtaining safe urban spaces]* (Santiago: División de Desarrollo Urbano, 2003)
- Ministerio de Vivienda y Urbanismo, Gobierno de Chile, Chile, *Un siglo de políticas de vivienda y barrio [Chile, A century of housing policies and neighbourhood]* (Santiago: Editorial Pehuén, 2004)
- Moneo, Rafael, 'On Typology', *Oppositions*, 13 (1978), 23-45
- Moneo, Rafael, 'Typology in the context of three projects: San Sebastian, Lacua, Aranjuez', *The Journal of Architecture*, 20 [number 6] (2016), 1067-1087
- Montoro Romero, Ricardo, 'Fundamentos Teóricos de la Política Social [Theoretical Foundations of Social Policy]', in *Política Social [Social Policy]*, ed. by María del Carmen Alemán Bracho and Jorge Garcés Ferrer (Madrid: McGraw-Hill, Interamericana de España, 1997), pp. 33-50
- National Association of City Transportation Officials, *Urban Street Design Guide* (New York: NACTO, 2012)
- Neufert, Ernst, *Architects' Data* (Oxford: Blackwell Science, 2000)

- NSW Planning Department, *Good Solutions Guide for Mixed Use Development in Town Centres* (Auckland: North Shore City Council, 2005)
- NSW Planning Department, *Good Solutions Guide for Apartments* (Auckland: North Shore City Council, 2002)
- Oechslin, Werner, 'Premises for the Resumption of the Discussion of Typology', *Assemblage*, 1 (1986), 36-53
- Organization for Economic Co-operation and Development, National Urban Policy Reviews, The Case of Chile: 15th Session of the Working Party on Territorial Policies in Urban Areas (Paris: OECD, 2013)
- Pai, Hyungmin, 'The diagrammatic construction of type', *The Journal of Architecture*, 20 [number 6] (2016), 1088-1104
- Pai, Hyungmin, *The Portfolio and the Diagram: Architecture, Discourse and Modernity in America* (Cambridge, MA: The MIT Press, 2006)
- Perez, Rodrigo, Alejandro Salazar, William Foster, Pablo Osses, 'El efecto de la distancia del mercado sobre la pobreza rural en la Región Metropolitana de Santiago [The effect of the market distance on rural poverty in the Metropolitan Region of Santiago]', *Revista Eure*, 116 (2013), 173-188
- Pizarro, Claudio, 'Bajos de Mena: sobreviviendo al gueto más grande de Chile [Bajos de Mena: surviving to the largest ghetto in Chile]', *The Clinic Online*, July 8 (2013) <<http://www.nutritionj.com/content/pdf/1475-2891-6-1.pdf>> [accessed 14 July 2014].
- Political Constitution of Chile, *Chapter I: Bases of Institutionalality* (1980) <https://www.constituteproject.org/constitution/Chile_2014?lang=en> [accessed 18 November 2015]
- Kemeny, Jim, *Housing and Social Theory* (London: Routledge, 1992)
- Quatremère de Quincy, 'Type', in *Oppositions Reader: Selected Readings from a Journal for Ideas and Criticism*, ed. by K. Michael Hays (New York: Princeton Architectural Press, 1998), pp. 616-620
- Rabinow, Paul, *French Modern: Norms and Forms of the Social Environment* (Chicago: University of Chicago Press, 1989)
- Rodríguez, Alfredo, Ana Sugranyes, *Los con techo: un desafío para la política de vivienda social [Those with a roof: a challenge for the social housing policy]* (Santiago: Ediciones SUR, 2005)
- Rodríguez, Jorge, '¿Policentrismo o ampliación de la centralidad histórica en el Área Metropolitana del Gran Santiago? Evidencia novedosa proveniente de la encuesta Casen 2009 [Polycentrism or extension of the historical centrality in Big Santiago's Metropolitan Area?] New evidence from the 2009 Casen survey', *Revista Eure*, 114 (2012), 71-97
- Rossi, Aldo, *The Architecture of the City*, trans. by Diane Ghirardo and Joan Ockman (Cambridge: MIT Press, 1982)
- Rubio Vollert, Rodrigo, 'Lessons of housing policy in Chile', *Bitácora urbano\territorial*, 10 (2006), 197-206

- Salazar, Gabriel, 'Urban bicentenary in Chile: which town for which city?', *Revista INVI*, 67 (2009), 9-18
- Schneider, Friederike, *Floor Plan Manual: Housing* (Basel: Birkhauser, 2004)
- Sepúlveda, Rubén, Jorge Larenas, Vanessa Prado, Bárbara Pratt, Juan Álvarez, 'Bicentenary: and opportunity to rethink urban housing policies in Chile', *Revista INVI*, 67 (2009), 21-67
- Serlio, Sebastiano, *On Domestic Architecture, Vol.2: different dwellings from the meanest hovel to the most ornate palace* (New York : Architectural History Foundation, 1978)
- Serlio, Sebastiano, *On Architecture* (New Haven: Yale University Press, 2003)
- Silva, Patricio, *In the name of reason: technocrats and politics in Chile* (Pennsylvania: The Pennsylvania State University Press, 2009)
- Steadman, Philip, *Building Types and Built Forms* (Leicestershire: Matador, 2014)
- Tafuri, Manfredo, *Architecture and Utopia: Design and Capitalist Development*, trans. by Barbara Luigia La Penta (Cambridge Massahustetts: MIT Press, 1976)
- Tapia Zarricueta, Ricardo, 'Social housing in Santiago. Analysis of its locational behaviour between 1980-2002', *Revista INVI*, 73 (2011), 105-131
- Teige, Karel, *Minimum Dwelling: The Housing Crisis, Housing Reform* (Cambridge, MA: MIT Press, 2002)
- The City as a Project*, ed. by Pier Vittorio Aureli (Berlin: Ruby Press, 2014)
- The Countryside Agency, *HRH The Prince of Wales's Affordable Rural Housing Initiative – A Design Guide* (London: Beacon Press, 2006)
- Till, Jeremy, 'Soft Space', *RIBA Research Symposium 2008: Space at Home* (2008) <<https://www.architecture.com/Files/RIBAProfessionalServices/ResearchAndDevelopment/Symposium/2008/JeremyTill.pdf>> [accessed 30 November 2015]
- Titmuss, Richard, *Social policy: An Introduction* (Michigan: Pantheon Books, 1974)
- Ungers, Oswald Mathias, *The Dialectic City* (Milan: Skira 1997)
- Unión Democrática Independiente (UDI), *Doctrina y Principios [Doctrines and Principles]* (1991) <http://www.udi.cl/website/contenido.php?S=7&SC=6&C=6#principio_3> [accessed 19 May 2014]
- Vidler, Anthony, 'The Idea of Type: The Transformation of the Academic Ideal: 1750-1830', *Oppositions*, 8 (1977), 94-115
- Vidler, Anthony, 'The Third Typology', *Oppositions*, 7 (1976), 1-4

